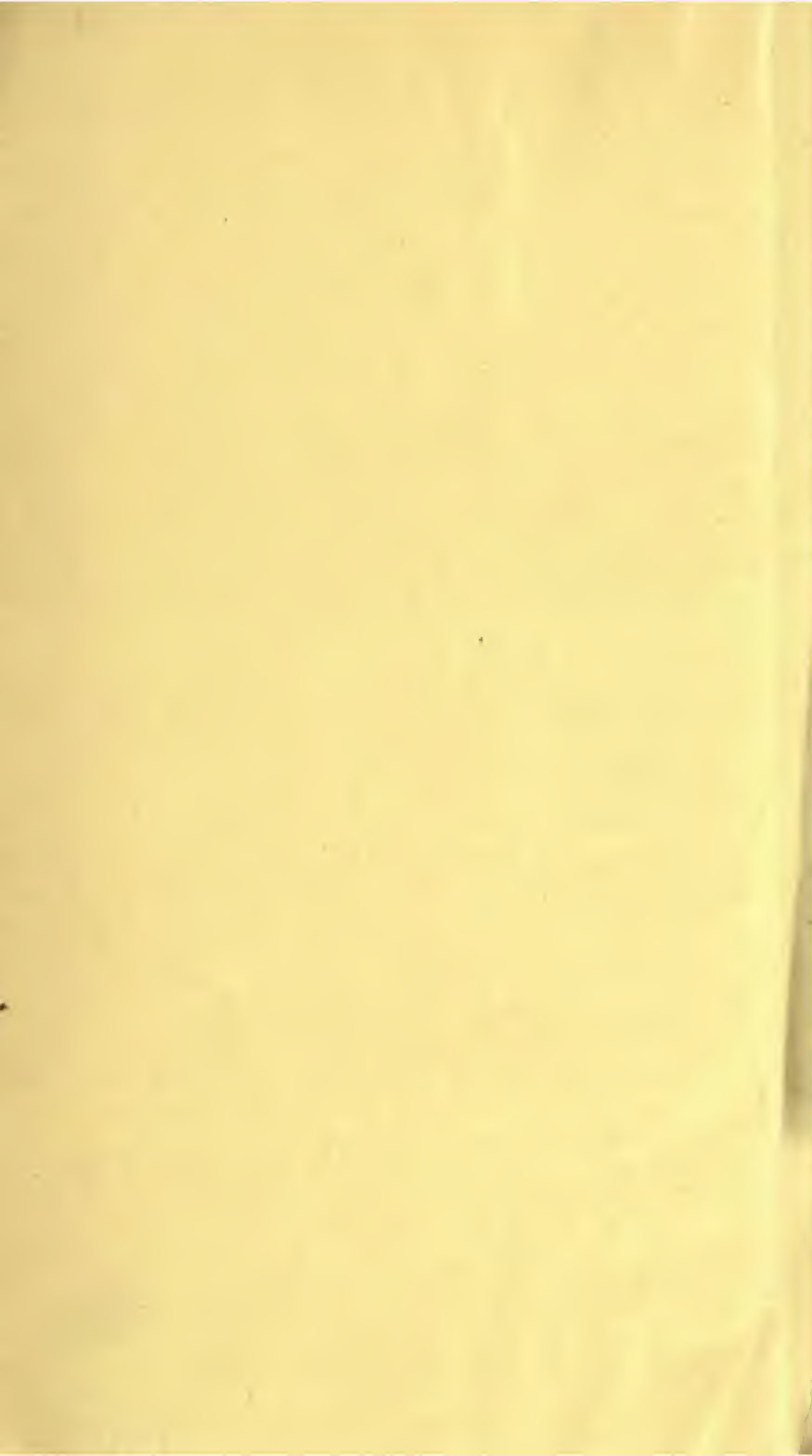


GOVERNMENT OF INDIA
ARCHAEOLOGICAL SURVEY OF INDIA
ARCHAEOLOGICAL
LIBRARY

ACCESSION NO. 8860

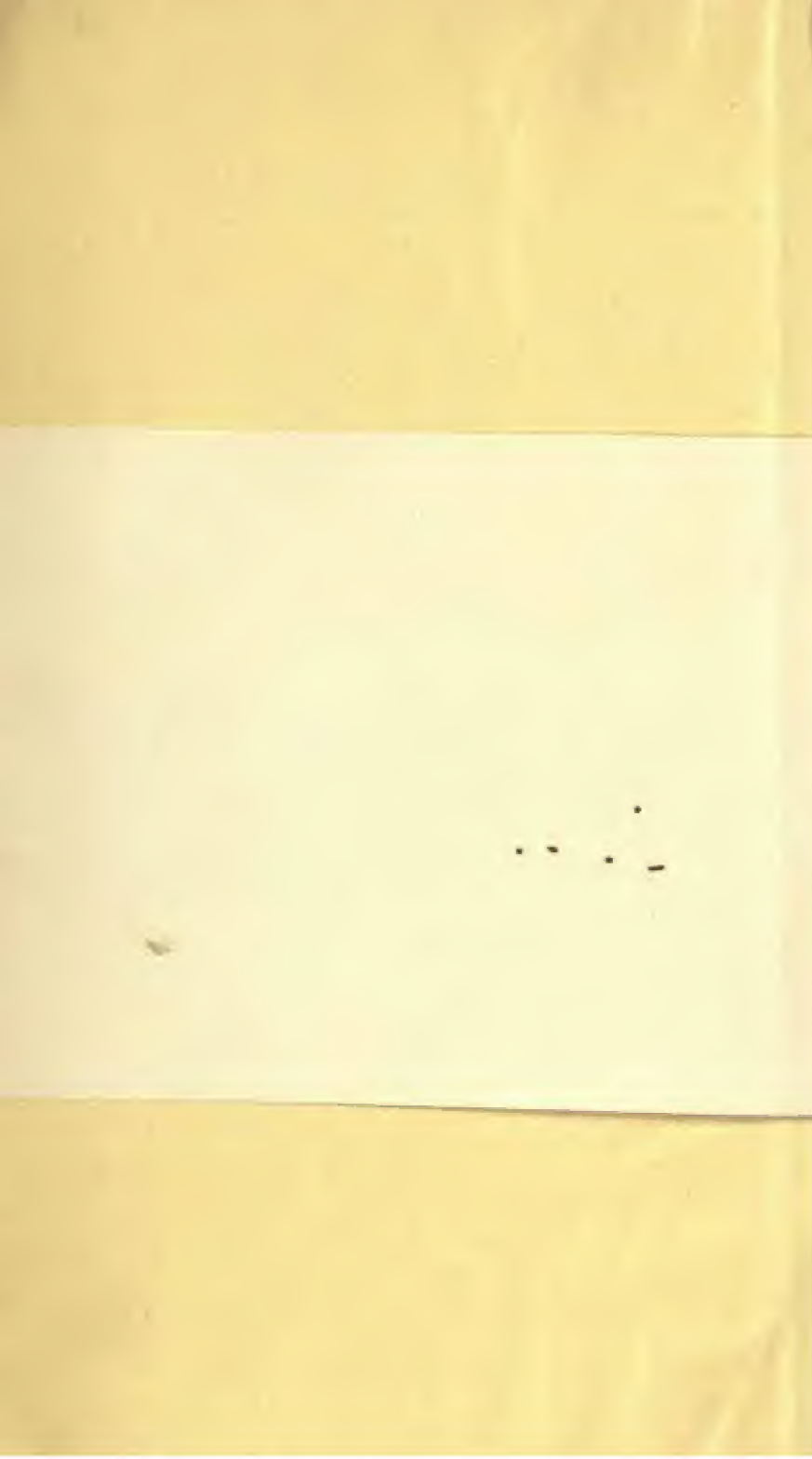
CALL No. 617.9/780954/Muk





9

The Illustrations will be issued shortly in the Second volume.



11
(2V08)

3-2026(2)

THE

Surgical Instruments of the Hindus





AA
~~1579~~

THE

SURGICAL INSTRUMENTS OF THE HINDUS

WITH

8860

A Comparative Study of the Surgical Instruments of
the Greek, Roman, Arab and the Modern
European Surgeons.

D3026 (g)

BY

GIRINDRANĀTH MUKHOPĀDHYĀYA, B.A., M.D.

*Fellow of the Calcutta University, McLeod Gold Medalist in Surgery, Formerly
Lecturer on Surgery, Calcutta Medical School and College of Physicians
and Surgeons (Bengal), Member of the Asiatic Society of Bengal,
Life Member and Professor of Botany, Indian Association for the Cultivation of Science, Examiner,
Calcutta University.*

Griffith Prize Essay for 1909.



In Two Volumes.

617.91780954

VOL. I.

Muk



Published by the Calcutta University.

1913.



CENTRAL ARCHAEOLOGICAL
LIBRARY, NEW DELHI.

Acc. No. 8860

Date..... 18-7-57.....

Call No. ~~617-918954~~

617-91780954 Mukh

Mukh

PRINTED BY ATULCHANDRA BHATTACHARYYA, AT THE CALCUTTA
UNIVERSITY PRESS, SENATE HOUSE, CALCUTTA.

TO
THE HON'BLE
SIR ASUTOSH MUKHOPADHYAY, Kt.,

Saraswati, Sastra-vachaspati,

C.S.I., M.A., D.L., D.Sc., F.R.A.S., F.R.S.E., F.A.S.B.,

**Judge of the High Court of Judicature at Fort William
in Bengal,**

VICE-CHANCELLOR, CALCUTTA UNIVERSITY.

Ex-President of the Asiatic Society of Bengal,

AND

Chairman of the Board of Sanskrit Studies,

In recognition of his love of Science, his pre-eminent services to the cause
of University Education, his administrative ability, and his generous
liberality to scholars

AS WELL AS

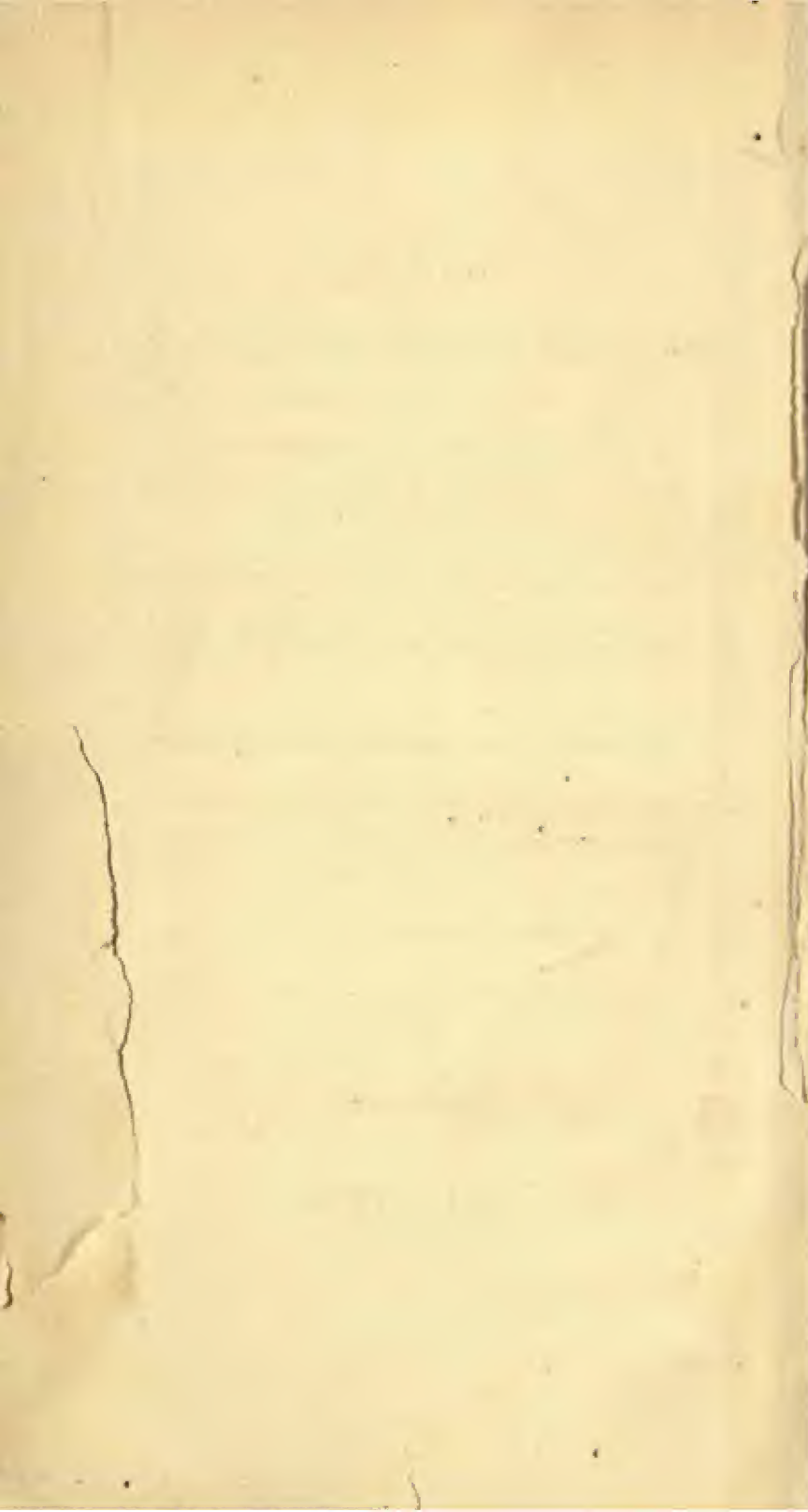
In grateful remembrance of many acts of kindness,

THIS VOLUME IS
DEDICATED

BY

THE AUTHOR





PREFACE.

For researches into the state of medicine among the Ancient Hindus, we have several sources of information to scrutinise. The remarks of Dr. Payne regarding the sources of information of Anglo-Saxon Medicine may apply here with still greater force.¹

First is the evidence of contemporary literature about the craft of physicians and surgeons, since we are sure that there has always been a class of medicine men of one kind or another. Thus we find in the R̥gveda, the use of artificial limb as a substitute for a limb accidentally lost². From the Mahābhārata,

¹ Payne's English Medicine in the Anglo-Saxon Times, P. 7.

² चरित्रं हि वैरिवाच्छेदि पथम्
 आजा खेलस्य परितक्त्रायाम् ।
 सद्यो जङ्घाभायसौ विशपलायै
 धने हिते सत्तवे प्रत्यधत्तम् ॥

R̥gveda—15th R̥k., 1st Mandala, 116 Śākta.

अगस्त्य पुरोहितः खेली नाम राजा तस्य सम्बन्धिनी विशपलानामस्त्री, संयामे शुभ्रभिः किन्नपदा आसीत् । पुरोहितेन अगस्त्येन मृतौ अश्विनौ रात्रौ आगत्य आधीमयं पादं समधत्ताम् । तदेतदाह 'आजा'—आजी, संयामे, अगस्त्य पुरोहितस्य—खेलस्य राजतः सम्बन्धिन्याः विशपलाख्यायाः, 'चरित्रं'—चरणं, 'वैरिव'—वैः पक्षिणः, 'पथं' पतत्रम् इव, 'अच्छेदि हि'—पूरा किन्नममृत् खलु । हे अश्विनौ ! युवां अगस्त्येन मृतौ सन्तौ, 'परितक्त्रायां'—रात्रौ, आगत्य, 'सद्यः'—तदानीमेव, 'सत्तवे'—सत्तुं गतुम् इत्यर्थः, विशपलायै 'आयसौ'—लौहमयौम्, 'जङ्घा'—जङ्घीपक्षितं पादम्, 'प्रत्यधत्तम्'—सन्धानम् एकीकरणमित्यर्थः कृतवन्तौ ।

we learn that when Parikṣit, the king of the Kurus, became certain of his approaching death by snake-bite, due to a curse uttered by a sage, he tried to protect himself by the constant attendance of a number of physicians, who were well supplied with antidotes.¹ Again it is stated that when the great warrior Bhīṣma was wounded in war, the skillful army surgeons came to him with the necessary medical and surgical appliances to treat his wounds.² From the Mohāvagga, we learn that Jīvaka, the personal physician of Buddha, practised cranial surgery with success.³ In the Mālavikāgnimitra, we find the use of charms—a signet

- ¹ संमन्त्र्य मन्त्रिभिश्चैव स तदा मन्त्रतत्त्ववित् ।
 प्रासादं कारयामास एकस्तम्भं सुरचितं ।
 रक्षाय विदधे तत्र भिषज्जयैषधानि च ।
 ब्राह्मणान्मन्त्रसिद्धाय सर्व्वतो वैद्ययोजयत् ।

Mahābhārata, Adi Parva, Ch. 42.

- ² उपार्तिष्ठन्नघो वैद्याः शल्योदरशकोविदाः ।
 सर्व्वोपकरणैर्युक्ताः कुशलैः साधु श्रिताः ।
 तान् दृष्ट्वा जाम्बवीपुत्रः प्रीयाच तनयं तव ।
 धनं दत्त्वा विस्मयन्तां पूजयित्वा चिकित्सकाः ।
 एवं गते मयेदानीं वैद्यैः कार्य्यमिहास्ति किं ।
 चतुर्धन्यं प्रशस्तां हि प्राप्नोऽस्मि परमां मतिं ।
 नैव धन्यो महीपालाः शरत्तपसतस्य मे ।
 एभिरेव शरैकाहं दम्बलोऽस्मि मराधिपाः ।
 तन्कुत्वा वचनं तस्य पुत्री दुर्योधनस्य च ।
 वैद्यान् विमर्ज्जयामास पूजयित्वा यथाऽर्हतः ।

Mahābhārata, Bhīṣma Parva, Ch. 121,

Vs. 5745—5750. (A.S.B. Ed.)

- ³ Mohāvagga, VIII. 1.18.

ring as a healing talisman for the cure of snake-bite;¹ and also we find there a reference to a class of physicians who specialised themselves in Toxicology (Viṣa-Vaidya),² and were held in high esteem for their professional skill by the public.³ From the Bhojaprabandha, the administration of some kind of anæsthetic by inhalation before surgical operations can be ascertained. Similarly from the books of Law, we know the relations of the profession to society in general. In the Manusamhitā, we have unmistakable testimony of the decline of Hindu surgery as the author prohibits the eating of cooked rice from the hands of a surgeon.⁴

¹ सङ्घि ! देवीए इदं सिधिसिन्धासादी आनीदनाममुद्रासणां चहुलीचषं सिधिदं
विभालचनी तूह उवालाभे पडिदसि ॥

Mālavikāgnimitra, Ch. I.

अय ।—जिदु जिदु भइ। धुवसिद्धी विषवेदी । उदकुम्बविधानेण सपमुद्रिषा कयिदवा ।
ता असेसीअदुत्ति । धारि ।—एदं सपमुद्रिषम् चहुलीचषम् । पक्का नह इत्ये वम् ।

Ibid, Ch. IV.

² परि ।—हिदी देशस्य दाही वा चतस्यारकनीचणम् । एतानि ददमावासा-
मादुष्याः प्रतिपत्तयः ॥ (संप्रति विषवेद्यानाम् कर्मम् ।)

राजा ।—अयसेने ! धुवसिद्धिः चिप्रमाइयताम् ॥

Ibid, Ch. IV.

³ निपु ।—पसणमुहवणी दीसदि । अवि च धुवसिद्धिणा चिद्रसिद्धी । मा से
असदणिज्जं पावं ॥

Ibid, Ch. IV.

⁴ चिकित्सकान्देवकान्नामजिह्विषयाया ।

विषयेन च जीवन्ती वज्राः स्युर्हृदयकान्धोः ॥

Manusamhitā, Ch. III, 152.

चिकित्सकस्य सगर्धोः क्रूरस्योच्छिष्टभीजिनः ।

उशाशं स्तिकाशं च पर्यावानामनिर्देशम् ॥

Ibid, Ch. IV, 212.

Secondly, monuments or inscriptions scattered about the country have to be searched, as references found therein to the science of medicine, are more trustworthy than documents which may have been more or less tampered with by interpolations of subsequent writers. Thus we learn from the Edicts of Aśoka, that hospitals were established by him in different parts of his kingdom, not only for the treatment of suffering humanity but also for the brute creation¹.

Thirdly, personages and scenes in connection with medical practice, and figures of herbs may have been represented in works of art which must be thoroughly examined. But unfortunately we do not possess any such work of art and so we can learn nothing to our purpose from this source. In the interpretation of the subject of the Friezes of the Rani Naur and Ganesha's Cave, Dr. R. L. Mitra says,—“The shampooing in the Ganesa Cave may be for a parent, but the close seat with the right hand round the neck of the male personage in the other, would be highly unbecoming in an unmarried female. But if the stooping figure be taken to be that of a wounded man, a wounded priest for instance, the lady may be a maiden nursing him without any offence to propriety. It is true that the appearance of the figure on the mattress does not indicate suffering from a wound, but in the Rani Naur frieze, the stooping head affords some indication of it.”²

पूये चिकित्सकस्यात्र पुंयत्वास्त्वन्ननिन्द्रियम् ।

विठा वार्ष्णिजकसारां ब्रह्मचिक्रियिणी नलम् ॥

Manusarāhita, Ch. IV, 220.

¹ Rock Inscriptions, Edict II.

² The Antiquities of Orissa, Vol. II, p. 11.

Fourthly, the various kinds of surgical instruments preserved in museums are to be examined and the reports of finds of surgical appliances in various localities are to be studied. We know what a flood of light has been thrown on ancient Greek surgery by the steady progress of archaeological discovery and finds of instruments at Pompeii, Herculaneum and elsewhere, and by the study of the specimens preserved in the Naples museum, the Athens museum and other museums of Europe. But as far as I have been able to trace, our museums contain no finds supplying us with any information on the subject.

Fifthly, the literature of medicine itself should be thoroughly inquired into and excerpts elucidative of our subject should be compared with one another. "The detailed descriptions of the very numerous Hindu instruments not being very minute or precise, Professor Wilson says, we can only conjecture what they may have been, from a consideration of the purport of their names, and the objects to which they were applied, in connection with the imperfect description given."¹ We are fortunate, however, in possessing a copious medical literature of great merit from very early times. We shall describe the important books in the introductory chapter, with short notices of their authors.

Sixthly, the comparative study of the science at the same period in other countries also furnishes us with valuable materials as regards the state of medicine in a country. It is well known that Sanskrit works are often written in a very terse language

¹ Royle's *Antiquity of Hindu Medicine*, foot-note, p. 59-60.

and it might be said with greater truth about the works of early Sanskrit authors, the comment of a learned critic about the style of Thucydides, the famous historian,—“the most obvious and characteristic of his peculiarities is an endeavour to express as much matter as possible in as few words as possible, to combine many thoughts into one, and always to leave the reader to supply something of his own. Hence his conciseness often becomes obscure.” I could not form any idea as to the shape of some of the surgical instruments from the descriptions given in the text books, and the commentators are often silent on those passages. But when I read the accounts of similar instruments in Greek and Roman literature, my difficulties at once cleared up. We know with what brilliant results comparative mythology and comparative philology have been studied of late years, and I am sure that a comparative study of medical science by scholars will lead to interesting discoveries. So I have added descriptions of the instruments according to the Greeks, Romans and Arabs at the end of the descriptions given in Sanskrit books: the former serving as commentaries on the latter.

Seventhly, in the accounts of historians, travellers and pilgrims from foreign countries, may be found notices of medical science, as they saw it practised during their sojourn in a country, and such impressions, if properly collated, may bear impartial testimony to the progress of the science at the time. Again, we must enquire if the original treatises of medicine can be proved to have been translated into different languages and whether the remedial agents of a country can be traced in the Pharmacopœias of different nations. Thus we

learn from the accounts of Houen Tsang and Fa Hian that charitable institutions such as hospitals, dispensaries and Pūnyasālās (Houses of Charity) were quite common in ancient India.¹ Arrian informs us in his *Indica* that the study of medicine among the Brahmans was in great favour.² We know that the standard works on medicine were translated in Arabic in the 8th Century B. C.,³ and that various medicinal herbs of Indian origin found their way into the Greek *Materia Medica*.⁴

Eighthly, we must enquire whether the medical practice of ancient times is still resorted to by the physicians of the present days. The Hindu system of medicine is still being practised all over India, more or less in its original form, and so can still be studied at first hand. But for our present purpose, we derive little or no help from the *Vaids* of the present generation. They know practically nothing about anatomy and surgery which began to decline during the Buddhist era, and finally all vestiges of the science became lost during the Mahomedan rule. I have spared no pains to exhaust these sources of information so far as surgical instruments are concerned. Whether or not I have been fortunate enough to give just the necessary details of instruments from the best accessible authorities without at the same time loading my pages with superfluous matter, must be left to the judgment of my readers to determine.

¹ Beal's *Buddhist Records of the Western World*, Vol. I., P. 165, 198 and 214; Vol. II., p. 188 and 303.

² Arrian's *Indica* c. 27.

³ Alberuni's *India*, Sachau's Preface, p. XXX—XXXI.

⁴ Royle's *Antiquity of Hindu Medicine*, p. 77-113.

Now it may be asked why the Science and Art of Surgery, which was successfully practised in Ancient India, is so much neglected by the present generation of *Vaidas*. So let us consider the causes that led to the downfall of Hindu Surgery:

1. The Hindus from a very early period have given up the dissection of human bodies—the only trustworthy method of acquiring anatomical knowledge—merely because it may occasion ceremonial uncleanness. The Ancient Hindus were, however, free from such prejudices. Manu lays down that mere bathing will purify a Brahman who has touched a corpse,¹ whilst stroking a cow or looking at the Sun, having only sprinkled his mouth with water will remove the defilement due to touching a dead bone.² But even in the *Manusamhitā*, we can trace the decline of Hindu surgery, and his law forbidding any one from eating food from the hands of a doctor evidently refers to a surgeon.³

2. The interference of the priests in India, as in Europe played an important part. They began to cure diseases by spells, charms, texts and drugs; and temples have served as consulting rooms for the treatment as much of the diseases

¹ दिवाकीर्णमुदकां च पतितं मृत्तिकां तथा ।

शर्वं तस्मृष्टिनं चैव स्पृहा स्नानेन शुध्यति ॥

The Institutes of Manu, Ch. V, 85.

² नारं स्पृहास्त्रि सखेष्टं खाला विप्रो विदुष्यति ।

आयस्यैव तु निषेष्टं नामासम्भारकमीक्ष्यवा ॥

Ibid, Ch. V, 87.

³ Ibid, Ch. III, 152; Ch. IV, vs. 212 and 220.

of the body as of the soul. The example of such a temple we still find in Tārakeśvar where many sick people repair to have their maladies cured by dreams, hypnotic suggestions and incubation or temple-sleep. Similar practice was prevalent in Egypt and Greece in olden times. The modern practice of using galvanic rings and abdominal belts is merely an advanced method of indulging in superstitious ideas.

3. The patients always dreaded the surgeon's knife—especially when the use of a general anæsthetic was unknown. At the same time, the comparative success of poultices, actual and potential cauteries, and other external applications have influenced the lay mind that operations by knife are not always needed.¹ The Hindu surgeons themselves believed in similar tenets, for Suśruta, the surgeon, remarks that "of all cutting instruments and their substitutes, caustics (or vegetable alkalies) are the most important, because by means of them, deep and superficial incisions and scarifications may be made, and derangements of the three humours (air, bile and phlegm) may be rectified"; and again he says that "with

¹ दिव्यीषधिं विना देवि शस्त्रविद्या मुनिष्फला ।
 वैरुष्यं कुरुते या च दुश्चिकित्से व्यधानरे ॥
 ज्ञायन्ते हि यथाशंसि पाटितानि पुनः पुनः ।
 किं तत्र शस्त्रसाध्यं स्यात् सुसिद्धैर्भेषजैर्विना ॥
 धातुनां व्यापदि यच्च भेषजे नैव सिद्ध्यति ।
 ह्याभये दुस्तरं तस्मिन् शस्त्रमेव विधीयते ॥
 पुनः संशयनं तत्र धातुनाम् हि प्रशानये ।
 प्रदातव्यं महादेवि शस्त्रादब्धाक् ब्रवीमि ते ॥

regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not reappear, and because it can cure diseases which are incurable by medicines, instruments and caustics."¹ Thus we see that the Hindus were partial to external applications as a cure of surgical diseases, and gradually they neglected the surgical operations—one of the most important means of acquiring knowledge in Morbid Anatomy and of testing the correctness of diagnosis, in the absence of the post mortem examinations of the cadavers. Thus not only surgery but medicine also suffered materially.

4. The Hindus always cherish a high regard for the writings of their sages, and the earliest works on medicine became the standard works and were held sacred. Any violation of their opinions was considered a sacrilege; and all knowledge thus soon became stereotyped. In later times, none dared to question the validity of the statements contained therein, and though about three thousand years have elapsed, and though the votaries of the science are still honoured and wellpaid, the science instead of improving has markedly deteriorated. In fact, only two authors—Caraka and Suśruta—are original; the later authorities—and there is a vast number of them—were merely their servile copyists who only differed from them when they indulged in some grave errors. We have a parallel in the history of medical science in Europe, where Galen

¹ चाराकप्रिमरीयान् क्रियासु व्याख्यातसहस्रानां रीमानामपुनर्भावेपञ्चमस्रचारि-
साध्यानां सत्साध्यत्वाद् ।

held his sway over the profession for about two thousand years.

5. One of the potent causes of progressive decadence in the knowledge and practice of surgery amongst the Hindus is the rapid spread of Buddhism in India. Though Buddha sanctioned the use of the lancet in some cases, in cases of a doubtful nature he prohibited the use of instruments in the treatment of even surgical diseases. For example, he allowed the surgical treatment of boils by knife,¹ but he prohibited not only the use of the lancet for treatment of fistula-in-ano but the use of clysters also.² As it would be interesting to know the reasons of this prohibition, I quote the story in full from the *Mohāvāgga* (Sacred Books of the East) :³

1. Now when the Blessed One had remained at Sāvatti as long as he thought fit, he went forth on his journey to Rāgagaha ; and wandering straight on he arrived at Rāgagaha ; and there at Rāgagaha he stayed at the Veluvana in the Kalandaka-nivāpa.

Now at that time a certain Bhikkhu was suffering from fistula. And the physician (named) Ākāsa-gotta lanced it. And the Blessed One when he was going round through the sleeping-places came to the place where that Bhikkhu dwelt.

2. Ākāsa-gotta, the physician, saw the Blessed One coming from afar ; and when he saw him he said to the Blessed One : ' Let the venerable Gotama come and look at this Bhikkhu's orifice ;

¹ *Mohāvāgga*, VI. 14. 4 & 5.

² *Ibid*, VI. 22. 3.

³ *Ibid*, VI. 22.

it is like the mouth of an iguana !' And the Blessed One thinking, 'This foolish fellow is making fun of me,' kept silence and turned away. And in that connection, and on account of that, he called a meeting of the Bhikkhu-samgha, and asked the Bhikkhus: 'Is there, O Bhikkhus, in that Vihāra a Bhikkhu who is sick ?'

'There is, Lord.'

'What is the matter, O Bhikkhus, with that Bhikkhu ?'

'That venerable one, Lord, has a fistula, and Ākāsa-gotta the physician, has been lancing it.'

3. The Blessed Buddha rebuked (that Bhikkhu), saying, 'This is improper, O Bhikkhus, for that foolish one, unbecoming, indecent, unworthy of Samanas, not allowable and ought not to be done. How can this foolish fellow, O Bhikkhus, allow a surgical operation to be performed in that part of his body? The skin there, O Bhikkhus, is tender, the wound is difficult to treat, the knife is difficult to guide. This will not redound, O Bhikkhus, to the conversion of the unconverted.'

And having rebuked him, the Blessed One, after delivering a religious discourse, said to the Bhikkhus: 'You are not, O Bhikkhus, to allow a surgical operation to be performed upon you in that part of your bodies. Whosoever allows that, is guilty of *thullakkaya* offence.'

4. Now at that time Khabbaggiya Bhikkhus, since a surgical operation had been forbidden by the Blessed One, used a clyster.

They told this thing to the Blessed One.

'Is it true, as they say, O Bhikkhus, that the Kḷabbaggiya Bhikkhus use a clyster ?'

'It is true, my Lord.'

He rebuked them, and having delivered a religious discourse, said to the Bhikkhus: 'No surgical opperation is to be performed within a distance of two inches round the anus, and a clyster is not to be used. Whoever does so, is guilty of a *thullakkaya* offence.'

And thus we find that Jivaka, the famous surgeon, is said to have cured a case of fistula-in-ano by the single application of an ointment.¹ The operation fell into such disuse that when Śaṅkarāchāryya suffered from the same disease, no surgical aid was thought necessary by the physicians, though it is said that he was treated by renowned doctors of the time.²

From Megasthenes," we learn that "among the Sarmans the Hylobioi (living in woods) were held in most honour, and next to them the physicians, who are mendicants and also ascetics, like the class above them and the class below them,

¹ "And Jivaka Kōṃārabhakkā healed the fistula of the Magadha King Seniya Bimbisāra by one anointing."

Mohāvāgga (Sacred Books of the East), VIII. 1. 15.

² अचिकित्स्वभगन्दराध्वरोगप्रसरच्छीणितपडिलस्त्रशाब्दा ।

अनुगुप्स्यविशोधनादिरुपां परिचव्यामकृताऽस्य तीटकार्यः ॥

* * * * *

निगदिते मुनिनेति भिषग्बरा विदधिरे बहुधागदसत्क्रियाः ।

न च ग्रामान् नदीवहुतापदीविमनसः पटवी भिषजोऽभवन् ॥

Śaṅkaravejōya, Ch. XVI.

which consisted of sorcerers and fortune-tellers;"¹ and Strabo² mentions that these physicians "cured diseases by diet rather than by medicinal remedies, which were chiefly unguents and cataplasms."³

6. No science can flourish without the support of the government of the day. The Hindus became a subject race; and any departure from the traditional store of knowledge in the shape of improvement in the quality and additions to its quantity was neither tolerated by the people, who are proverbially conservative, nor countenanced by the royal court, for the conquerors brought with them and patronised their own hakeems and doctors. Neither the Mahomedans nor the English have taken any real interest in the Indian Medical Science from preconcieved notions that it contains nothing worthy of their perusal. The *Kavirajes* again are so conservative in their opinions that they can not boldly advocate even the use of such drugs as are of unquestionable value in the treatment of diseases, as for example the use of Quinine in Malaria. To this may be contrasted the behaviour of Bhāvamiśra, who lived about three hundred years back and who adopted many medicaments of foreign origin. The consequence can easily be imagined, and in the language of Elphinstone, can be thus described: "Physicians follow the practice of their instructor without inquiry, and surgery is so far neglected, that bleeding is left to the barber, bone-setting to the herdsman, and every one is ready to administer

¹ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 358.

² Geography, XV. i. 58-60.

³ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 368-69.

a blister, which is done with the juice of the euphorbium and still oftner with the actual cautery."¹

But we need not enlarge any further. The object of this essay is not to write out an exhaustive dissertation on the Hindu medical science but by a few suggestive facts, however imperfect and fragmentary, to stimulate curiosity and divert attention of the diligent scholars to a vast field of research, which seems as yet to have been only partially explored.

It is proper here to acknowledge that I have on all occasions freely availed myself of the labours of Drs. Wise, Thakore Saheb of Gondal, and the translators of *Suśruta Saṁhitā* in the *Bibliotheca Indica*, namely, Dutt and Hoernle. It is a great pity that this translation has not as yet progressed beyond three fasciculi. Hoernle's recent contribution, "*Osteology of the Hindus*," is a move in the right direction and we hope it to be followed by similar enquiries in other branches of the science. Royle for the first time proved beyond doubt the high antiquity of Hindu medicine, and established its right position in the history of the science. Wise is the pioneer of systematic research in this field of study, and his sympathetic appreciation of the Hindu system of medicine will always be remembered with gratitude by our countrymen. Dutt's *Materia Medica of the Hindus* is a work of great merit; and I have derived material assistance from the excellent treatise, "*History of Aryan Medical Science*," by the Thakore Saheb of Gondal. Dr. Ray's *History of Hindu Chemistry* is a valuable contribution in the cognate subject of chemistry. I have borrowed from these writers largely, but

¹ Elphinstone's *History of India*, 5th Ed., p. 160.

I flatter myself it will also be found that I have further collected from various sources a store of valuable information, for which I am in no way indebted to any of my predecessors in the same field of research. The descriptions of the surgical instruments of the Greeks, the Romans and the Arabs, I have taken from the excellent English translations of Paulus Ægineta, the Extant Works of Ætius and the Genuine Works of Hippocrates, prepared by the renowned Adams, for the Sydenham Society. I have also laid the recent monograph, "Surgical instruments in Greek and Roman times" by Dr. Milne, largely under contribution; I only regret that I had no access to the book a little earlier, otherwise much of my labour in search for descriptions of the instruments of the Greeks would have been saved. For the last five years, I have been engaged on this investigation and it was when I had nearly finished, that Milne's book was mentioned to me by the Hon'ble Mr. Justice Asutosh Mookerjee, the Vice-Chancellor of the Calcutta University and the President of the Asiatic Society of Bengal.

To complete the subject, I have added plates of nearly all the varieties of instruments; but they are more or less hypothetical as we do not possess any actual specimens of the instruments of the Hindus. Written descriptions of surgical instruments are uninteresting and often fail to convey the true idea, which could be easily made evident by the pencil. For purposes of comparison I have given drawings of instruments of the Greeks, the Romans and the Arabs, when I thought that they might be of value for the proper elucidation of my subject. I am indebted to many authors

I am indebted to many authors for some of the engravings of the instruments. I have been careful to give the source whence the borrowed ones are taken, as far as I have been able to ascertain them. If this has been omitted in any case, it is from inadvertence, not from design. My best thanks are due to them and I here acknowledge my indebtedness to the authors for availing myself of their labours without their permission. But many new illustrations will be found, and I have appended my name to those drawn by myself. These figures of the surgical instruments would be found to tally better with the descriptions of the instruments given in the Sanskrit books than the illustrations of the previous authors. The drawings of surgical instruments as given by me would look more like the figures in a modern catalogue of surgical instruments. Some of my friends could hardly believe when they saw the plates that these instruments were known to the ancient Hindus at such an early age. This feeling of amazement and incredulity as regards the surgical instruments used by the ancient Hindus has its parallel in the observations of Billroth¹ about the surgical instruments found in the excavations at Pompeii and now preserved in the museum at Naples. He says: "It made a peculiar impression upon me; when I saw before me this two thousand years old surgical armamentarium of a Roman colleague, differing but slightly in the form of the more ordinary instruments from those of our time. *Ars longa vita brevis.*" Milne² also remarks: "The works of those (Paré, Scultetus and Heister) are profusely illustrated with instruments, some of which can plainly be seen to tally exactly with the descriptions of the classical authors."

¹ Billroth's Surgery, Vol. I, Introduction, Page 7. Syd. Soc. Ed.

² Græco-Roman Surgical Instruments, P. 8.

In describing the surgical instruments, I have confined myself strictly to the texts of the authors and commentators whom I have quoted, and have given the original Sanskrit passages in the foot-notes. These will be of great help to scholars who will try to study the subject at first hand, and prosecute further historical inquiries. The references in the foot-notes do not refer to pages of any particular edition of the work, as such pagination causes inconvenience to the readers who may not secure the edition in question; so we have given the section, and chapter of the book which will be found in any edition.

In the translations of Sanskrit passages, I have endeavoured to follow the original as closely as possible, except where a somewhat free rendering was necessary to make the meaning clear.

The dates of the ancient Hindu authors of Sanskrit medical books cannot be ascertained with certainty. In the first chapter I have endeavoured to discuss briefly their approximate ages. But as I have compared the surgical instruments of the ancient Hindus with those of the Greeks, Romans and Arabs, a concise summary of the chronological dates of the Græco-Roman, Arab, and the later authors would be a great help in the proper elucidation of my text.

<i>Authors.</i>	<i>Date.</i>
Pythagoras	580-504 B.C.
Megasthenes	300 B.C.
Ktesias	400 B.C.
Hippocrates	460 B.C.
Hero of Alexandria	285-222 B.C.

<i>Authors.</i>	<i>Date.</i>
Dioscorides ...	First century A.D.
Celsus ...	25-30 B.C. to 45-50 A.D.
Scribonius Largus ...	45 A.D.
Soranus ...	First century A.D.
Rufus of Ephesus ...	98-117 A.D.
Galen ...	131-201 A.D.
Marcellus Empiricus ...	300 A.D.
Antyllus ...	3rd century, A.D.
Oribasius ...	326-403 A.D.
Theodore Priscianus ...	4th century A.D.
Caelius Aurelianus... ..	4th or 5th century A.D.
Moschion ...	5th century A.D.
Actius... ..	5th century A.D.
Alexendar of Tralles ...	525-605 A.D.
Paulus Ægineta " "	660 A.D.
Serapion ...	800 A.D.
Rhazes ...	850-932 A.D.
Haly Abbas ...	After 950 A.D.
Avicenna ...	980-1037 A.D.
Abul Cassim ...	x 1106 A.D.
Avenzoar ...	x 1162 A.D.
Paré ...	1509-90 A.D.
Scultetus ...	1650 A.D.
Heister ...	1739 A.D.

I can not suffer this work to go forth without offering at least an explanation of, if not an apology for, the delay which has occurred in the publication of this thesis. It is mainly due to the accidental fire which reduced the types and the blocks

for this work to ashes and destroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not uncommon. Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirendranāth Mukhopādhyāya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. But I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefectorily and I have done my best. I have laboured with the usual drawbacks of an active professional life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

A copious index has been provided for this work, whereby anything material in the whole book may be readily found out; of which it may be said that it wants no other advantages than such as the author had not power to give.

It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last

session Dr. Girindranath Mukerjee submitted to the society a paper of considerable extent, in which he elaborately examined the subject of the surgical instruments of the ancient Hindus. The questions he has raised, as to the priority of Hindu medicine over that of the Greeks, the Romans and the Arabs, are likely to arouse controversy, but in whatever way the question of priority may be decided, it seems to me truly remarkable that the descriptions given in our most ancient books on medicine, of the surgical Instruments then in use, should bear a close resemblance to the descriptions given not only in Greek, Roman and Arab medical writings but in many cases with the descriptions given in modern works on surgery. I trust that this subject, so peculiarly Indian, will not be left alone and will receive the attention from investigators which it undoubtedly deserves."¹

As regards the transliteration of Sanskrit words, we have employed the method adopted in the Congress of Orientalists and circulated in the Journal of the Royal Asiatic Society, ignoring in fact, the unpleasant characters of the Sacred Book of the East.

¹ Journal and Proceedings of the Asiatic Society of Bengal, Vol. V, 1009, Annual Address, p. XXX.

I

SANSKRIT AND ALLIED ALPHABETS.

अ a	ओ o	ट ṭ	व v
आ ā	औ au	ठ ṭh	भ bh
इ i	क k	ड ḍ	म m
ई ī	ख kh	ढ ḍh	य y
उ u	ग g	ण ṇ	र r
ऊ ū	घ gh	त t	ल l
ऋ ṛ	ङ ṅ	थ th	व v
ॠ ṝ	च c	द d	श ś
ऌ ḷ	छ ch	ध dh	ष ṣ
ॡ ḹ	ज j	न n	स s
ए e	झ jh	प p	ह h
ऐ ai	ञ ñ	फ ph	ळ ḷ

* (Anuscāra) m	ॡ (Avagraha) ' .
* (Anunāsika) ṁ	Udātta ˆ
: (Visarga) ḥ	Scarita ˘
× (Jihvāmūliya) ḥ	Anudātta ˜
× (Upadhmāniya) ḥ	

CONTENTS.

	PAGES.
PREFACE	i—xxii
Sources of information : contemporary literature ; monuments and inscriptions ; figures of herbs and scenes of medical practice ; museums ; medical books ; comparative study ; accounts of historians, travellers and pilgrims ; medical practice of the present time. Downfall of Hindu Surgery : causes : discontinuance of dissection ; interference of priests ; dread of the surgeon's knife ; authority of the ancient sages ; Bud- dhism ; want of Government help. Acknow- ledgment. Chronological dates of the Greco- Roman, Arab and later authors. Transliteration. of Sanskrit words.	
CONTENTS	xxiii—xxix
CORRIGENDA	xxx—xxxj
WORKS BY THE AUTHOR	xxxii

CHAPTER I.

INTRODUCTION	1—33
--------------	------

Ancient medical authors and their works : Āyur-
veda ; Atharvaveda : Caraka Saṁhitā,—age of
Caraka, editions and commentaries ; Suśruta
Saṁhitā—Dhanvantari, Suśruta, Nāgārjuna,—
age of Suśrutā, Candrāṭe, Pañakāpya,—editions

and commentaries. Vāgbhaṭa I,—Aṣṭāṅga Saṁgraha, his age, edition and commentary; Vāgbhaṭ II: Aṣṭāṅga Hṛdaya Saṁhitā, editions and commentaries; Vagbhaṭā III—Rasa Ratna Samuccaya; Mādhavakara:—Nidāna; Vṛnda Madhava:—Siddhayoga; Cakrapāṇi-datta:—Cikitsāsāstra Saṁgraha, editions; Śāraṅgadhara:—Śārāṅgadhara Saṁgraha, editions and commentary; Bhāva Miśra:—Bhava Prakāśa, editions.

CHAPTER II.

HOSPITALS AND DISPENSARIES ... 34—60

Hospital in the Caraka Saṁhitā; Greek iatrium; list of appliances in surgical operations; the lying-in-room; the child's room; room for operated cases; the kitchen; qualities of a good patient and a good nurse; Charitable hospitals during the reigns of Aśoka and Śīlāditya II; Puṇyaśālās; animal hospital; opinions of ancient sages as to the merit of the founder of a hospital; Dispensaries; Anaesthetics.

CHAPTER III.

MATERIALS OF INSTRUMENTS ... 60—89

Iron and Steel, Copper, Tin, Lead, Bell-metal, Gold and Silver, Horn, Bone and Ivory; Wood, Stone. Execution. Ornamentation. Edges of sharp instruments. The tempering of sharp instruments. Good and bad qualities of surgical instruments. The uses of instruments.

PAGES.

Whetstone. Instrument cases. Boxes for ointments, ointment pots, and portable cases. Kapāṭa-Sāyana or Fracture-Bed.

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS ... 90—99

Instruments and their classification; The Yantra or blunt instruments; The Svastika or cruciform instruments; The Sandaṁśa or pincher-like instruments; The Tāla or picklock-like instruments; The Nāḍī or tubular instruments, the śalākā or rod-shaped instruments. The Upayanta or accessory instruments. The Śāstras or sharp instruments. The Anuśāstras or substitutes for sharp instruments.

CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS ... 100—224

1. The Svastika yantra or cruciform Instruments:
 - Siṁhamukha svastika or Lion-faced forceps.
 - Vyāghramukha or Tiger forceps.
 - Vṛkamukha or Wolf forceps.
 - Tarakṣumukha or Hyena forceps.
 - Rkṣamukha or Bear forceps.
 - Dwipimukha or Panther forceps.
 - Mārjāramukha or Cat forceps.
 - Śṛgālamukha or Jackal forceps.
 - Airbhāraka or Deer forceps.
 - Kākamukha or Crow forceps.
 - Kaṅkamukha or Heron forceps.
 - Kuraramukha or Osprey forceps.
 - Cāsamukha or Blue-Jay forceps.
 - Bhāsamukha or Eagle forceps.
 - Śaśaghātīmukha or Hawk forceps.
 - Ulukamukha or owl forceps.
 - Cillimukha or Kite forceps.
 - Syenamukha or Vulture forceps.
 - Gṛdhramukha or Falcon forceps.

Kraucāmukha or Curlew forceps. Bhrūgarājā-
 mukha or Butcher-bird forceps. Añjalikarṇa
 forceps. Avabhañjanamukha forceps. Nandi-
 mukha forceps. II. The Sandarśa or Pineher-
 like forceps: Forceps with and without
 handles. Forceps with Smooth and rough ends.
 Epilation forceps. Mucuṭi or Mucundī.
 Vathśabidala or Bamboo forceps. III. Tāla-
 Yantra or Picklock-like instrument: Ectāla
 and Dvitāla. The Ear-scoop. IV. The Naḍi-
 Yantra or Tubular instruments: Kaṇṭhaśalyā-
 valokinī or Throat speculum. Pañcamuka and
 Trimukha. Tubular instruments for inspec-
 tion of arrows. Śalyanirghātani. The Impel-
 lent. Tubular instruments for Piles—for inspec-
 tion and medication. Śamī. The Rectal Specu-
 lum. Calopter. Tubular instruments for the
 Fistula-in-ano. Tubular instruments for the
 nose: Nasal Speculum. Nathu-karani, and
 Yamaka-nathu-karani. Nasal tubes. The
 Aṅguli-trāṇaka or Finger-guard. Yoni-
 Vraṇekṣana or Vaginal Speculum. Diopter.
 Bivalve Speculum. The tubular instruments for
 wounds—Vraṇa-vasti or Wound-Syringe.
 Tubular instrument for ascites. Dākodara yantra
 or Canula. Tubular instruments for Hydrocele.
 Tubular instruments for rectal stricture.
 Tubular instruments for injection into the
 rectum—Vasti Yantra or Rectal clyster.
 Uttaravasti or urethral, vaginal and uterine
 tubes. Catheters. Tubular instruments for
 inhalation and fumigation. Disinfection
 of rooms, clothes &c. Tubular instru-
 ments for cupping. Śrūga or horn. Alābu
 Yantra or gourd. Ghati Yantra. V. Śalakā

or rods: Earthworm probes. Arrow probe. Snake's hood probe. Fish-hook probes. The Śaṅku; Swab probe. Spathomele or spatula probe. Spoon-shaped probes. Cyathiscomele. Nail-shaped probes. Jāmvavauṣṭha probe. Gamma-shaped probe and the aṅkuśa cautery. Collyrium probes. Karṣa Śodhana or Ear-cleaner. Garbha-Śaṅku or Fetus or Traction hook. Yujña-Śaṅku or Midwifery forceps. Sarpa-faṇa or snake's hood-like rods. Stone extractor. Hippocratic oath. Sarapuṅkha-mukha Probe. Arddhacandramukha or Half-moon Probe. Bone Lever. Director. Urethral Probe. VI. The Upayantra or Accessory Instruments. Rajju or thread, Venikā or twine; Paṭṭa or Bandages, Abdominal binder, Field Hospital, Dressings. Carma or leather: leather bandage, leather ligatures. Yantra-Śaṭaka or Lithotomy-Strap or binding apparatus, Pāśa. Leather bags. Śīrovasti or leather-bag for the head. Leather Band. Leather Bottles, Jars, etc. Antarvalkala or Barks. The crutches, Tendrils of creepers or Latā. Vastra or cloth. Aṣṭhilāṣma or stone. Mudgara or Hammer. Pāṇipadātala or hand and foot. Aṅguli or fingers. Jihvā or tongue. Danta or tooth. Nakha or nails. Mukha or mouth. Vāla or hair. Probang. Suture material. Aśvakaṭaka or the ring of a horse's bridle. Śākhā or branch of a tree. Śthīvana or spittle. Pravāhana or fluxing the patient. Harā or Happiness. Ayaskānta or Load-stone. Kṣāra or Caustics or Potential cautery. Agni or Actual cautery. Bheṣaja or medicines. Goats' gut; Arrest of hæmorrhage.

CHAPTER VI.

THE ŚĀSTRA OR THE SHARP INSTRUMENTS ... 225—281

The Mandalāgra or round-headed knife. Karapatra or saw. Vṛddhipatra—dīrghavaktra and hrasvavaktra—the long and short-mouthed knives. Hypodermic medication. Nakhaśāstra or Nail-parer. Mudrikā, angulisastra or finger or ring-knife. Utpalapatra, Phlebotome. Arddhadhāra, Cakradhāra, adhyardhadhāra. Suci or needles—curved, half curved and straight. Javamukhi needle. Kuśapatra. Āṭimukha. Śararimukha or scissors. Antarmukha: arddhacandrānana or half-moon-faced scissors. Ardhacandra knife. Trikūrecaka, kūreca, khāja. Kuṭhārikā. Vṛhimukha or trocar. Ārā or awl, Karṇa-vedhanī or ear-perforator, Juthikā, Pānimantha. Karmāra or nālī. . Vetaspatraka. Vajṛiśa or sharp hook, Danta-Śaṅku or tooth-scaler. Danta-lekhana or tooth-scaler. Enīpada. Eṣani or sharp probes; needle-shaped probes, Kuruvaka probes. The operation of couching of catamet. Yavamukhi Śālā. Sarpāśya. Gold or silver knife. Pratuda. The mode of holding the sharp instruments. The practical training in surgical operations.

CHAPTER VII.

THE ANUŚĀSTRA OR ACCESSORY SHARP INSTRUMENTS... 282—294

Bamboo. Dissection. Crystal, Glass and ruby.
Leeches. Fire and caustics. Fingers and nails.
Leaves. Young stems of plants.

CHAPTER VIII.

HYGIENIC APPLIANCES AND HOSPITAL REQUISITES ...	295—328
---	---------

Tooth-brush. Tooth-pick. Razor and Shears. The practice of shaving. Keṣa-prasādhani or comb. Looking-glass. Dress. Uṣuṣa or head-dress. Chatra or Umbrellas. Yaṣṭhi or sticks. Upānaha or shoes. Vyājanī and cāmara or the fan. Filters. Water vessel. Bathing. Drinking Vessels. Dinner service. Spoons. Spittoons. Bedpans and Urinals. Pus Basins. Pestle and mortar. Sieves, Strainers and filters. Cold and hot applications. Balance or Māṇadanda. Collyrium pots. Medicine glass. Dropper. Grind-stone. Stone and iron muller.

CHAPTER IX.

THE CONCLUSION	329—362
--------------------------	---------

Claim of Indian Medicine as a historical study.
The knowledge of the Science in ancient India.
Antiquarian value of the study. A comparative study. Relation of the Hindu and Greek Medical Science. Indebtedness of the Persians, Arabs, Chinese, Tibetans and the modern Europeans.

Appendix	365—366
List of works consulted	367—371
Index—English	374—416
Sanskrit	417—444

CORRIGENDA.

Page	ii	F. N. 3		
"	xi	Para 5		
"	xi	...	F. N. 1	
"	xiii	...	" 1	read Mahāvagga for Mohāvagga.
"	82	line 4	" 1	
"	116	" 23	" 5	
"	182	" 10, 15	" 2	
"	x	10		
"	202	" 1 of para. 5		
"	203	" 2 & last line		
"	262	" 12		
"	306	...	" 1	" diagnosis " diagnosis.
"	317	" 10		
"	319	...	" 3	
"	320	" 5	" 1	
"	xiii	...	" 2	" Vijaya " Vejaya.
"	xv	...		" Bibliotheca " Bibliotheca.
"	3	...	" 1 & 2	
"	303	...	" 1	" Macdonell " Macdonel.
"	4	...	" 1	
"	17	" 7		" Dārīa " Dārīa.
"	27	item 8		" Bhānumati " Vānumati.
"	30	...	" 1	" Rabi " Robi.
"	12	...	" 3	" Archao " Archao.
"	31	...		" Śārngadhara " Śārngadhara.
"	35	" 13		
"	40	" 8		" Skūful " Skillful.
"	37	" 11		" Sesame " Sesame.
"	39	" 23		" Bhūrja " Bhūrya.
"	40	" 14		" Water and " Water,
				Mortar Mortar.
"	70	"	" 3	
"	71	...	" 1 & 3	" Vṛddha " Vṛddhya.
"	87	" 2 & 4		
"	88	" 13		" Kapāṭa " Kapāta.
"	99	" 8		" Pālakāpya " Pālakapya.
"	109	" 8		" Śalya " Salya.
"	117	" 5		" bambu " bambu.
"	119	" 19		" Barnes' " Barnes.
"	120	" 21		" Sarta " Shorta.

Page 159	line 13	...	read	Jāmvorauṣṭha	for	Jamvovauṣṭha.
" 178	item 10	...	"	Cīna	"	China.
" 181	"	" 2	"	Obstetric	"	Obstetric.
" 196	line 12	...	"	Gayadāsa	"	Gayadāssa.
" 219	" 14	...	"	Sesamum	"	Sesam.
" 219	" 21	...	"	effectual	"	effectual.
" 221	item 3	...	"	Pācana	"	Pachana.
" 242	line 2	...	"	Parietes	"	Parietis.
" 292	" 10	...	"	Round...four	"	four cornered...
				cornered		.....round.
" 285	" 15	...	"	Hippo	"	Hyppo.
" 295	" 3	...	"	Requisites	"	Requisites.
" 306	" 11	...	"	Yaṣṭhi	"	Yaṣṭi.
" 311	item 2	...	"	octagonal	"	octagonal.
" 328	" 3	...	"	hātā	"	hata.
" 331	line 18	...	"	Jolly	"	Jolley.
" 340	" 5	...	"	Physician	"	Physian.
" 346	" 18	...	"	amber	"	ambar.
" 348	" 2	...	"	Paitāmaha	"	Paitāmoha.
" 352	" 22	...	"	Firoz	"	Firroz.
" 354	" 11	...	"	Areca	"	Arecha.
" 355	" 12	...	"	Dvārusita	"	Davrusita.

WORKS BY THE AUTHOR.

1. Muscles of the Human Body, arranged in Tabular forms.
Fourth Edition. Re. 1

2. Tropical Abscess of the Liver.

Thesis approved for the degree of Doctorate in Medicine,
Madras University. Rs. 5

3. Glossary of Indigenous Medicinal Plants.

(In the Press).

4. Notices, Biographical and Bibliographical, of the Indian
Physicians and their Works on Medicine.

(In the Press)

5. Medicine in the Vedic times.

(In preparation)

THE STAR MEDICAL HALL,
80, Russa Road North, Bhawanipur,
CALCUTTA.

THE Surgical Instruments of the Hindus.

CHAPTER I.

INTRODUCTION.

ANCIENT MEDICAL AUTHORS AND THEIR WORKS.

The Science and Art of Medicine, like many other different branches of learning originated with the Hindus. They consider the art of healing as an Upaveda and it is generally known as Āyurveda, that is the art of prologing life. Like the Vedas, they trace the origin of the science to God, the fountain of all true knowledge. Bramhā transmitted this heaven-born science to this world, for benefit of the mortals in one of the sacred writings, the Āyurveda.

It was composed as a sub-division of the Atharva Veda and consisted originally of a *lākh slokas* or a hundred thousand stanzas, divided into a thousand chapters. Then considering the short span of life and inadequate intelligence of man, he divided the book into eight parts¹ as follows:—

¹ तद्यथा ॥ शल्यं शालाकं कायचिकित्सा भूतविद्या कौमारभक्ष्यमग्निदत्तनम्
रसायनतन्त्रं बाजीकरणतन्त्रमिति ॥

Suśruta Saṁhitā, I. i.

कायचिकित्सा शालाकं शल्यहर्तृकं विषगरवैरोधिकप्रशमनं भूतविद्या कौमारभक्ष्यं
रसायनानि बाजीकरणमिति ।

Caraka Saṁhitā, I. xxx.

वेदो ज्ञानसंज्ञः सत्यव्ययवर्जितमङ्गलहोमनिश्चयप्रशस्तिरुपवासमन्त्रादिपरिदृष्टान् चिकित्सा
शास्त्रम् ।

Ibid.

1. Śalya Tantra or Major Surgery.
2. Śālākya Tantra or Surgery of parts above the Clavicles.
3. Kāya Cikitsā or Inner Medicine.
4. Bhūtvidyā or Demnology.
5. Kaumārabbhṛtya or the Science of Pædiatrics.
6. Agada or Toxicology.
7. Rasāyana or Treatment to prolong life.
8. Vājīkaraṇa or Treatment to stimulate the sexual power.

The book is no more available now, Suśruta being the authority for the above information.¹

A different view is held by others, who trace the origin of Hindu Medicine in the verses of the R̥gveda.²

¹ इह खल्लागुर्वेदो नाम यदुपाद्मवर्णवेदस्यानुत्पादैव प्रजाः द्यौकश्तसहस्र-
मभ्यायसहस्रं कृतवान् स्रयम् । ततोऽत्रागुहमत्यमेधमाद्यावलीका नराणां मृयोऽपि धा-
प्रचोतवान् ॥

Suśruta Saṁhitā, I. 1.

तत्र चित् प्रहारः स्याः चतुर्षोऽक्षसामयजुर्वर्णवेदानां कं वेदमुपदिशन्त्यागुर्वेदविदः ।
किमायुः कश्चादागुर्वेदः किद्यायमागुर्वेदः शाश्वतोऽशाश्वत इति । कानि चास्याहानि
कथायमप्रातल्यः किमर्घ्येति ॥

तत्र भिषजा पृष्ठेनैवं चतुर्षोऽक्षसामयजुर्वर्णवेदानाम् आत्मनोऽद्यर्ववेदे भक्तिरादेशः ।

Caraka Saṁhitā, I. xxx.

The origin of medical science, as quoted in the above passage of Caraka, does not however agree with the view expressed by the author in the Sūtra Sthāna, Ch. I. (See footnote 1. P. 4). In Ch. XXX, we find that an attempt had been made to make a compromise between the two views of Agniveśa and Suśruta. Evidently this was the work of a later redactor, possibly Dr̥havalā.

न चागुर्वेदस्यामूलोत्तरूपलभ्यते । अन्ववावरीधीपदेशाभ्यामेतदे इयमधिकृत्य उच्यति-
मुपदिशन्त्येके सामाविकत्वासा लक्षणमधिकृत्य यदुक्तम् इह चायेचाभादे • • • ॥

Caraka Saṁhitā, I. xxx.

² अग्रेदस्यागुर्वेद उपवेदः ।

Carana Vyāha by Vyāsa.

ATHARVA VEDA.

"On examining the contents of the Atharva Veda more in detail, we find that the hostile charms it contains are directed largely against various diseases or the demons which are supposed to cause them. There are spells to cure fever (*takmān*), leprosy, jaundice, dropsy, scrofula, cough, ophthalmia, baldness, lack of vital power, fractures and wounds; the bite of snakes or injurious insects, and poison in general; mania and other ailments. These charms are accompanied by the employment of appropriate herbs. Hence the Atharva Veda is the oldest literary monument of Indian Medicine."¹ This Veda can not belong to a period later than 1000 B. C., but possibly earlier.² It exists in the recensions of two different schools. That of the Paippalāda is only known in manuscript, discovered by Prof. Buhler in Kashmir and described by Prof. Roth in his tract *Der Atharva Veda in Kaschmir* (1875). The printed text, edited by Roth and Whitney in Berlin 1856, gives the recension of the Śaunaka School.³ It has been translated into English Prose by Whitney, 2 Vols.; into English verse by Griffith, 2 Vols., Benares, 1897, and with the omission of the unimportant

¹ McDonnell's Sanskrit Literature, P. 196.

अथर्ववेदस्य ०००० चतुर्थं वेदत्रयेऽपि प्रायेणामिचारवर्धत्वाद्यज्ञविद्यायामनुप-
योगानिर्दिष्टः । तदाहि अस्वेदेनैव हौषं कुर्वन् यजुर्वेदेनाश्वथं च सामवेदेनोद्गाथं
यदेव चयौ विद्याय नृक्षन्ते ब्रह्मत्वमित्युते स्मयीमन्यायत्वं यज्ञानां ज्ञायते ।

Kaṭhaka Bhaṭṭa's Commentary on Manu Saṁhitā, Ch. III, Śloka I.

² On the date of Atharva Veda, see pp. CXL—CLXI, Prof. Lanman's Edition of Whitney's Transl.; Prof. McDonnell's Sanskrit Literature, pp. 185—201.

³ Index Vervorum in the Journal of the Am. Or. Soc. Vol. XII.

hymns, by Bloomfield¹ into English Prose, with notes, in Vol. XLIII of the Sacred Books of the East.

CARAKA SĀMĤITĀ

In the Caraka Sāmhita we find that Brahmā taught Dakṣa the science of medicine; Dakṣa became the preceptor of the Aśvin twins; they in their turn became the teachers of Indra and Indra imparted this knowledge to Bharadvāja who was sent by a conclave of sages to learn the art for the welfare of the human race.² Bharadvāja had Punarvasu Ātreya and the others as disciples. Ātreya's students were Agniveśa, Bhela, Jatukarṇa, Parāśara, Hārita and Kṣārapaṇi, all of whom became celebrated as the authors of treatises on Medicine; the Caraka Sāmhita being a revised and improved edition of the treatise of Agniveśa, which was declared to be the best production.³ Caraka did not, however, redact the whole

¹ He has also edited the Kanśika Sātra of the Atharva Veda, with extracts from the commentaries of Dārīta and Keśava (see Vol. XIV Journ. Am. Orient. Soc.). It is very useful as a help to the proper understanding of the meaning of a hymn.

² दीर्घोचितमखिलं नृ भद्रं वाज उपायमत् ।

इन्द्रमुद्यतपा बुधा शरणा ममरिष्वरम् ॥

ब्रह्मणा हि यथा प्रीतमायुर्वेदं प्रजापतिः ।

जवाह निखिलेनादावग्निनी तु पुनस्ततः ॥

अग्निर्भा भगवान् शक्रः प्रतिपेदे ह केवलम् ।

अविप्रीतो भरद्वाजस्तस्माच्छक्रमुपायमत् ॥

Caraka Sāmhita, I, 4.

³ अथ सैवीपरः पुनश्चायुर्वेदं पुनर्वत्सुः ।

जिह्वेभ्यो दत्तवान् षड्भ्यः सर्वभूतानुकम्पया ॥

अपि वैश्व भेलश्च जतुकर्णः पराशरः ।

हारीतः क्षारपाणिश्च जम्बहस्तमुनेर्वचः ॥

बुद्धेर्विशेषस्तत्ताम्रीपदेजाननं मुनेः ।

ततस्तथ कर्तो प्रथममपि वैश्री यतोऽभवत् ॥

अथ भेलादयश्चक्रुः सर्वं तत्तत् कृतानि च ।

यावदायामुपराचिरे सर्विसहं मुनेधमः ॥

book;—the last forty-four chapters¹ were edited by Drḍhavalā,² a native of Panchanadapura, long supposed to refer to Punjab (the land of five rivers) but at present identified with a town in Kashmir by Dr. Hoernle.³ Two other works, the treatises of Bhela and Hārīta, are still extant; the former existing in manuscript in the Tanjore Library⁴ and the latter as printed texts by *Kavirājes* K. C. Sen and B. L. Sen, of Calcutta.⁵

Now as regards the age of Caraka, there is great divergence of opinions. The Indians generally believe him to be a Rṣi of great antiquity while the European scholars try

¹ For a discussion on the part added by Drḍhavalā, see Hoernle's *Studies in Ancient Indian Medicine*, J. R. A. S. 1908, P. 997-1002. Also see pp. 11-15 in the *Vanaśudhi Darpaṇa*, Vol. I., by Kavirāja Birajā Charan Gupta, 1908.

² अतस्तन्मोक्षममिदं चरकैकातिबुद्धिना ।

संस्कृतं तत् तु संघटं विभागेनीपल्लवते ॥

इदमनूतशब्दार्थं तन्नेदीयविवर्जितं ।

अस्यच्छाद्यं हृदयलीजातः पचनदे पूरे ॥

ऊला बहुभक्षन्नेभ्यो विशेषाच्च वलीकयम् ।

सनदशोषधाज्जायसिद्धिकल्पैरपूरयत् ॥

Caraka Saṁhitā, VIII, xii.

अस्मिन् सनदशाज्यायाः कल्पाः सिद्धय एव च ।

नामादात्तेऽग्निवैजस्य तन्ने चरकसंस्कृते ॥

तानेतान् कापिलवलः शेषान् हृदयलीऽकरीत् ।

तन्मस्यास्य महाघस्य पूरणार्थं यथातथम् ॥

Ibid, VI, xxx.

³ Hoernle's *Studies in the Medicine of Ancient India*, Part I, Osteology, Introduction, p. 2. See also his article on "The authorship of Caraka Saṁhitā" in the *Archiv für die Geschichte der Medizin*, 1907.

⁴ See Burnell's Tanjore Catalogue No. 10773 of Sanskrit Mss., P. 63.

⁵ It is doubtful whether the Hārīta Saṁhitā is the genuine work of the Rṣi, Hārīta. The printed text refers to Caraka, Sūśruta and even Vāgbhaṭa, who were decidedly posterior to Hārīta, See the Footnote 3, P. 6.

to connect him with historical events of more modern times. Sylvain Lévi has recently discovered in the Chinese Translation of the Buddhist *Tripitaka* that Caraka was the Court Physician of the Indo-Scythian King Kaniska, in the first century A.D.¹ But the following objections are to be met with before his conclusions can be accepted as proved :—

1. The age of Kaniska is not yet settled, the probable limits of his reign being from the first century B. C. to the second century A. D.² Moreover in the Buddhist *Tripitaka* referred to, the name of Caraka is simply mentioned as the Court Physician of the King Kaniska but there is nothing to identify him with the author of the book. The same name, found in different places, does by no means signify the same person.

2. The time assigned to Caraka by the Indian medical tradition is of great antiquity. With regard to the chronological position of the three old authors, he is mentioned as anterior to Suśruta and Vāgbhaṭa I.³

3. Dr. Rāy has pointed out that the name Caraka is patronymic in the Veda.⁴ It is quite possible that a much

¹ See *Journal Asiatique*—July to December 1896, p. 444 to 484 and January to June 1897, p. 5 to 42; also *Indian Antiquary* Vol. XXXII, 1903, p. 382 and *Viena Oriental Journal*, Vol. XI., p. 164.

² See V. A. Smith's *Early History of India*, P. 225-26.

Dr. Fleet in *J. R. A. S.*, 1906, P. 979.

Dr. Bhandarkar in *J. R. A. S. (Bombay Branch)*, Vol. XX, P. 269.

J. A. S. B. Vol. XXXIX, 1870, p. 65 and 126.

१ चरकः सुश्रुतश्चैव वाग्भटश्च तथापरः ।
सुश्रुतश्च मंहिता वाग्भटश्चैव एव युने युने ॥
अभिः कृतयुने वैद्यो वापरि सुश्रुतो मतः ।
कल्पी वाग्भटनामा च परिमात्र प्रहृष्टने ।

Hārta Saṁhitā, Parīśiṣṭadhāya.

⁴ Dr. P. C. Rāy's *History of Hindu Chemistry*, Introduction, P. X.

later namesake of his, is referred to by the *Tripitaka*, just as we know that more than one Vāgbhaṭa appeared as successful physician. Again we have evidence that eminent physicians in later times were called Caraka by way of a compliment and so Vāgbhaṭa was called Caraka of Sindh or Sindhicara.

4. Pāṇini wrote special Sūtras for the Agniveśas and the Carakas.¹ These names must have been famous before Pāṇini's time, otherwise he would not have written special Sūtras for them. Prof. Goldstucker has conclusively proved that Pāṇini could not have flourished later than the sixth century B. C.²

5. Patañjali wrote a commentary on Caraka.³ He flourished during the second century B. C. Both Cakrapāṇidatta and Bhoja allude to him as the redactor of Caraka Saṁhitā.⁴ So Caraka must have flourished long before him, for unless his work was regarded as a standard work of authority, Patañjali would not have taken so much pains to write notes on the book, and still more for issuing a redaction.

6. The internal evidence of the book itself speaks against such an assumption. There is no salutation to any deity at the

¹ कटवरकाङ्कः । Pāṇini 4. 3. 107.

गर्गादिभ्यो यञ्च ॥ Ibid, 4. 1. 105.

गर्गः । वत्स । * * * * अग्निवेष्ट * * * * पराशरः । अतुल्यः । * * * .

* Goldstucker's Pāṇini; and Journal of the Asiatic Society of Bengal, Vol. XLII, P. 254.

³ आनीनाम अनुभवेन वस्तुतत्त्वस्य कात्वेन निश्चयवान्, रामादिब्रह्मादपि मान्यवावादी यः स इति चरके पतञ्जलिः ।

Quoted in Laghumañjusa of Nāgeśa Bhaṭṭa (Rāy).

⁴ पातञ्जल—महाभाष्य—चरकप्रतिषेद्धतेः ।

मनीषाक्-कावदीषाणाम् ईर्ष्यादिपतये नमः ॥

Fide salutation in the Āyurvedārthadīpikā.

beginning of the book,—a custom invariably found to be observed in the more modern compilations. There is complete absence of Paurāṇic theology in the Caraka Saṁhitā, nor is there any reference to Śākya Muni and his religion. Kaniṣka was a great patron of Buddhism, and it might naturally be expected from the Court Physician of the king to describe the charitable hospitals which we know from the edict of Aśoka, to have flourished in every quarter of India. On the contrary we find descriptions of a hospital as reserved for rich men only at their own houses. Those gods and goddesses that figure so prominently in the Purāṇas were unknown during his time.¹ Beef was not then, apparently, a

¹ No doubt the names of Lakṣmī, Kṛṣṇa and Vāsudeva occur in Cikitsāta Sthānam, Chapter XXV, but it should be remembered that they occur in the Supplement added by Dr̥ghavala in later times.

सर्वयज्ञा न तव प्रभवन्ति न चाग्निशस्त्रश्चपराः ।

लक्ष्मीय तव भजते यत मङ्गागम्यह्वयसि ॥

पिबमान इमं ह्यतः सिद्धं मन्त्रमदीरयेत् ।

मम माता जया नाम विजयी नाम मे पिता ॥

सोऽहं जयो जयापुत्री विजयीऽय जयामि च ।

नमः पुरुषसिंहाय विष्णवे विश्वकर्माणे ॥

सनातनाय कृष्णाय भवाय विभवाय च ।

तेजो वषाकपेः साक्षात् तेजो ब्रह्मेन्दुर्योग्ये ॥

यथाहं नाभिजानामि वासुदेवपराजयम् ।

Caraka Saṁhitā, VI, xxv.

But Kṛṣṇa and Vāsudeva are mentioned in Pāṇini as demigods, having many adherents who formed a class. "वासुदेवार्जुनाभ्यां पुनः" Pāṇini, 4. 3. 98. Again the passage may be an interpolation of a subsequent *Vaiṣṇavika* *Vaid*.

So Br̥ghavadhvaṇa is also mentioned in Dr̥ghavala's Supplement, as a god to be worshipped during the preparation of some medicines :

ब्रह्मघोषशङ्खपटहनेरीनिनादेः सिद्धं सितश्वजतच्छायं मज्जकम्भारीपथैर्गमन्
प्रवञ्जमभिपूज्य तं खेहं विभारमाचिकमङ्गलाग्नीःस्तुतिर्देवतार्चनैर्वर्क्षि गमयेत् ॥

Ibid. VIII, xii.

forbidden food, for it is spoken of as an article of diet that should not be indulged daily,¹ nor should it be used in excessive quantity as it is mentioned as a cause of the disease, Vāta-Rakta.²

The style of the book is antiquated and decidedly savours that of the Brāhmaṇas. Nāya and Vaiśeṣiki systems occur in the text,³ and so probably the book was written long before the compilation of these Sūtras.

Editions.—The book had undergone several editions. It was edited by Jibānanda Vidyāsāgar, Calcutta, in 1877 and 1896 (2nd Ed.) ; by Gaṅgādhar Kaviratna, Berhampur, 1879 ; by Gupta, Calcutta, 1897 ; with commentary by Cakrapāṇidatta, Calcutta, 1892-93 ; by Jaśodānandana Sarkār, with Bengali translation, 1894.

Translations.—It had been translated into English by A. C. Kaviratna, Calcutta, 1897. *Caraka was translated from Sanskrit

And we find that the antidote to poison called महागन्धहारी is said to have been told by Tryambaka (Śiva) to Baiśravaṇa (Kuvera):

अमदीद्रे वैश्रवाणस्यातन्मन्त्रकेषु षट्पङ्क्तयः ।

Caraka Saṁhitā, VI. xxv.

Also we find the name of Kārttikeya mentioned in Sec. IV. ch. viii.

प्रसूय त्वमविक्रिष्टमविक्रिष्टा यमामने,

कार्तिकेयमुति पुत्रं कार्तिकेयाभिरचितमिति ॥

¹ कुर्विकाय किलाटाय शीकरं गव्यमामिषं ।

मत्स्यान् दधि च माषांश्च यावकांश्च न शीलयेत् ॥

Ibid, I. v.

² कुलत्थमावनिष्पावशाकादिपल्लवेषुभिः ।

दध्नाग्नालर्षावीर्यकृतकसुरासपैः ॥

Ibid, VI. xxix.

³ Vide Caraka, III. viii.

into Arabic in the beginning of the eighth century and his name "Sharaka Indianus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka" from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrist, (Finished 987 A.D.). It is likewise mentioned by Albērūnī²; the translation is said to have been made for the Barmekides.³ Albērūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Ali Ibn Zain, from Trabaristan."⁴

Commentaries.—

1. Patañjali—2nd century B.C.—not available.
2. Cakrapānidatta's Caraka Tātparya Tikā, or Āyurveda-dīpikā⁵—1060 A.D.
3. Haricandra⁶—1111 A.D.—not available.
4. Śibadāsa's Caraka-Tattva-Pradīpikā.
5. Gaṅgādhar's Jalpa-Kalpa-Taru,—1879 A.D.

¹ Proceedings of the As. Soc., Bengal, 1870, September.

² Reinaud, *Memoire sur l'Inde*, P. 316.

³ Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

⁴ Sachau's preface to India, P. XL.

⁵ See Caraka Saṁhitā with Cakrapānidatta's Commentary by Karirāja Harināth Viśārada, Calcutta, 1895.

⁶ A Commentary written by Haricandra is referred to in the Sanskrit Śloka narrating the geneology of Maheśvara, the author of Viśvaparakāśa and Sāhasāṅkacarita, who flourished during the reign of Sāhasāṅka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

श्रीसाहस्राक्षपतेरश्वविद-

वैद्यीश्वर्य पदपङ्क्तिमेव विमत् ।

यश्चन्द्रबाह्वरिती हरिचन्द्रनामा

सर्वज्ञाया चरकतन्त्रमलङ्कार ॥

SUŚRUTA SĀMĤITĀ.

The next treatise on Hindu Medicine is the Suśruta Sāmhītā. Suśruta was the son of the sage Viśvāmitra,¹ a contemporary of Rāma. He learned the Science of Medicine from Divodāsa, surnamed Dhanvantari, king of Benares, at his Himalayan retreat. According to Suśruta, Divodāsa was the incarnation of Dhanvantari, the celebrated physician of the gods in heaven, and he first propounded the Art of Healing in this world.² Suśruta represented the Surgical School while Caraka was pre-eminently a Physician in practice.

As regards the authorship of the book, opinions differ. To Suśruta, Dhanvantari addressed his lectures on Major Surgery,³

¹ Mahābhārata, Anuśāṣana Parva, Ch. 139, Vs. 8-11.

धन्वन्तरिर्धर्मभङ्गां वृष्टीं वाग्मिशारदः ।

विश्वामित्रावाक्यस्य शिष्यं सुयुतमश्रयात् ॥

Suśruta Sāmhītā, V. ii.

अष्टाङ्गवर्जदविदं दिवोदासं महामतिं ।

किञ्चशास्त्रार्थसन्देहं सूक्ष्मागधमिषोदधिं ।

विश्वामित्रसुतः शौमान् सुयुतः परिपूज्यति ।

Ibid, VI. lxvi.

सर्वशास्त्रार्थतत्त्वञ्च क्षपीडयिषि रुदारधौः ।

वैश्वामित्रं शशासाय शिष्यं काश्रिपतिर्मुनिः ॥

Ibid, VI. xxviii.

² अथ खलु भगवन्तममरवरसुविगणपरिहृतमायमर्थं काशिराजं दिवोदासं धन्वन्तरि-
मोपधेनववैतरणीरसपोष्कालावतकरवोध्यमीपुररचितसुयुतप्रभृतय ऊतुः ।

Ibid, I. i.

³ अथ कथं किमुच्यतामिति । त ऊतुः । अस्माकं सर्वेषामेव ज्ञानज्ञानमूलं
स्त्रीपदिशतु भगवानिति । स उवाचैवमस्मि । अस्माकमेकमतौना मतमभिसमोच्य
सुयुतो भगवन्तं प्रशस्यति ।

Ibid, I. i.

which he reproduced in this work. But in the opening lines of the book, salutation is offered to Brahmā, Dakṣa, Aśvins, Indra, Dhanvantari, Suśruta and others.¹ This shows that Suśruta can not be the author of the work or at least of the work in its present shape, for no author can offer salutation to himself. By "the others" are no doubt meant the notable surgeons who practised and taught the Science of Surgery and who were either contemporary with or posterior to Suśruta. Possibly the original Suśruta Saṁhitā had been recast and the redactor could appropriately offer a salutation to the original author and to other surgeons who flourished before him. There is also an Indian medical tradition, noted in Dallapācārya's Commentary, which assigns the improved and supplemented edition of Suśruta's original work to Nāgārjūna,² the celebrated Buddhist Chemist, who is said to have been a contemporary of the king Śātvāhana.³

In the third chapter, Suśruta enumerates the subjects described by him,—the chapter forming an index of the book. Therein he mentions the five principal divisions of his book and says that the Uttara Tantra or the Supplement would be

¹ नमो ब्रह्मप्रजापत्यश्विनभद्रमिन्द्रन्तर्मनुमुतप्रवृत्तिभ्यः ।

Suśruta Saṁhitā, I.

² यत् यत् परीक्षे (नियमितं) तत्रैव प्रतिस्मृतं नृवं चातव्यमिति । प्रतिस्मृतं शोषीकं नामार्जुन एव ।

Dallapācārya's Commentary to Suśruta, I. i.

See also Dr. Cordier's *Recentes Decouvertes*, pp. 12-13.

³ See Harṣacarita by Vāpa.

Beal's *Buddhist Records of the Western World*, Vol II., P. 209, 212, 216.
Burgess' *Archaeological Survey of S. India*.

Introd. à l'histoire du Budh. Ind., P. 508.

described afterwards.¹ Now the fact that the sixth part was appended to the work as a Supplement or Uttara Tantra (i.e., after treatise) clearly shows that it was written afterwards by another surgeon and added to the original treatise. If the original Suśruta wished to have six divisions of his book, he would have mentioned it clearly in the index and would not have, after stating that his book consisted of five parts, added that "the Supplement would be described afterwards,"² which seems to be an interpolation of the Supplementor to pass his edition as the original work of the author. Again at the end of the fifth section, there is a passage describing the importance of the Āyurveda, which was meant as the conclusion of the book by the author.³ It is to be noted

¹ प्रागभिहितं सविंशमध्यायशतं पञ्चसु स्थानेषु । तत्र सूत्रस्थानमध्यायाः षट्चत्वारिंशत् ।
वीड्य निदानानि । दश शरीराणि । चत्वारिंशच्चिकित्सितानि । अष्टौ कल्पाः । तदुत्तरं
षट्षष्टिः ।

अध्यायानां शतं विंशमेवमेतदुदीरितम् ।

अतः परं स्मार्त्तव तन्मुत्तरमुच्यते ॥

Suśruta Saṁhitā, I. iii.

² बीजं चिकित्सितमैतत् समासेन प्रकीर्तितम् ।

सविंशमध्यायशतमस्य व्याख्या भविष्यति ॥

तत्र सविंशमध्यायशतं पञ्चसु स्थानेषु । तत्र सूत्रस्थाननिदानशरीरचिकित्सितकल्पे-
ष्वध्यायशतं सविंशमध्यायशतं तन्ने शेषानर्थान् व्याख्यायिष्यामः ।

Ibid, I. i.

³ सविंशमध्यायशतमेतदुक्तं विभागशः ।

इहोद्दिष्टाननिर्दिष्टान्स्थानान् ब्रह्मानर्थान्तरं ॥

सनातनत्वाद्देवानामपरत्वात्तथैव च ॥

तथा दृष्टकृतत्वाच्च हितत्वादपि देहिनां ।

शाकसमुद्भावेविस्तारात् पूजितत्वाच्च देहिभिः ॥

चिकित्सितात्पुण्यतमं न किञ्चिदपि सुखम् ।

चापेरिन्द्रप्रभावमानृतधीनिभिर्गुरोः ॥

धारयित्वा तु विमलं मतम् परमसम्पत् ।

उक्ताहार समाचारैर्ह प्रेत्य च मोदते ॥

Ibid, V. viii.

that at the end of no other sections do we find a similar passage. He also writes: "Thus one hundred and twenty chapters are described" but adds: "The other diseases shall be described in the Uttara Tantra": the latter part no doubt is an interpolation of the Supplementor. Moreover, in the opening lines which serve as a preface to the sixth part, the authority quoted for the diseases of the eye is Nimi, the king Janaka of Mithilā and not Dhanvantari.¹ But in the first chapter of the first section, it is described that the sages wanted Dhanvantari to teach them Śalyatantra or Major Surgery only and he consented to their request. And this subject he treated in detail in the five sections of the book. In the Supplement, on the other hand, are described the other branches of the science such as Minor Surgery, Inner Medicine, &c. Probably this part was added afterwards to give completeness to the treatise; and the original Suśruta was called *Vyddhya* or the Old by the commentators to distinguish him from the Supplementor.

Suśruta's work is specially important to us as having two whole chapters (vii and viii of Section I.) devoted to the descriptions of Surgical Instruments and one whole chapter (xxv of Section I.) to the principles of Surgical Operations.

The age of Suśruta is also involved in obscurity. Nothing can be ascertained from the fact that he was a son of Viśvāmitra²,

¹ अथयानां व्रते विशे वदन्ममऽन्यथा ।
वत्यामि वदधा सत्यमुक्तरेऽर्वाभिमानिति ॥
इदानीन्तं प्रवत्यामि तन्ममुक्तमुत्तमं ।
निखिलेनीपदिशने यत्र रोगाः इवम्बिधाः ॥
शालाकशालाभिहिता विदेहाधिपकौर्त्तिताः ॥

Suśruta Saṁhitā, VI. L.

² Viśvāmitra is the *gotra* name; so the simple name may either refer to the great Viśvāmitra or to his descendants.

for the age in which the latter lived is not known to us. But he must have flourished during the Vedic Age as many Vedic Hymns are ascribed to him. In the Mahābhārata, Suśruta is mentioned as one of the sons of Viśvāmitra¹ and in the Suśruta Saṁhitā the author is often described as his son. The age of the great epic has, with good reasons, been fixed at 1000 B.C. So Suśruta must have flourished much earlier. The latest limit which we can assign to Suśruta is 600 B.C. as "there are indications in the *Śatapatha Brāhmaṇa*, a secondary Vedic work, that the author of it was acquainted with the doctrines of Suśruta" as regards the Osteology. "The exact date of that work is not known, but it is with good reason referred to the sixth century B.C." Again in the Atharva Veda, in the tenth book, there is a hymn on the creation of man in which the skeleton is described according to Ātreya and Suśruta.² "The large portion of it (Books I to XVIII) indeed admittedly belongs to a much earlier period, possibly as early as about 1000 B.C.; and the hymn in question is included in this older portion"³. This shows that Suśruta could not have flourished later than 1000 B.C.

Again in Hasti-Āyurveda, a book on the Treatment of

¹ श्रामायनीस्य शर्मन्तु जावलिमुद्रस्तथा—

* * * * *

विश्वामित्राजः सर्वे सुनयो ब्रह्मवादिनः ॥

Mahābhārata, Anuśāṣana Parva, Ch. IV.

* See J. R. A. S., 1906, P. 915; 1907, P. 1.

* Hoernle's Studies in the Medicine of Ancient India, Part I. Osteology, Introduction, P. 9.

Elephants by Pālakāpya, we find the Surgical instruments described after the manner of Suśruta. Pālakāpya lived as a Veterinary Surgeon in the Court of Romapāda, King of Aṅga, which had as its capital the famous town of Campā, identified with the modern town of Bhāgalpur. King Romapāda was contemporary with king Daśaratha, the father of Rāma, the hero of Rāmāyana.¹ Here we have a corroborative evidence of the age of Suśruta.

Suśruta is mentioned in the *Vārttikas* of Kātyāyana² who flourished during the fourth century B.C.

We have alluded to Nāgārjūna,³ the Buddhist Chemist, as the redactor of the Suśruta Saṁhitā. He is said to have been a contemporary of king Kanīṣka that is about the first century B.C.

Another revision was undertaken by Candrāṭe, the son of Tīsaṭa, the author of Cīkitsā-kalikā. He revised the text which must have fallen then into a state of corruption. The probable date of Candrāṭe is the ninth century A.D.⁴

¹ अष्टिं युयुदमानस्य पितरं च वदन्निनम् ।

एतस्मिन्नेवकाले तु रोमपाद प्रतापवान् ।

Rāmāyana, Valakāṇḍam, Ch. IX.

See also Rāmāyana, i, 11, 13-20; Mahābhārat, iii, 110, 10008-9; Bhāgavat, ix, 23, 7-10.

² सुयुतेषु प्रीतिं सौयुत ।

³ Possibly more than one Nāgārjūna appeared in ancient India as a chemist. Alberuni says: "He lived nearly a hundred years before our time" (India, I. P. 189). Rājatarāṅginī places him in the 3rd century B.C. (I. Vv, 172-173). The modern scholars are of opinion that the founder of the Mahāyāna system lived in the first century A.D.

⁴ Hoernle's Osteology, p. 100.

There is no doubt of the tradition that Suśruta's work was redacted, for the author could not write such a passage as follows: "The surgical treatises of Aupadhenava, Aurabhra, Suśruta and Pouṣkalāvata from the basis of other treatises on the subject."¹

*Commentators.*²—

1. Cakrapāṇidatta—Vānumati—1060 A.D.
2. Gayadāsa—{Nyāya Candrikā }—11th century A.D.
or Pañjikā
3. Jejjāṭācāryya.
4. Bhāskara.
5. Mādha.
6. Brāmhadeva.
7. Dallanācāryya—Nibandha Saṅgraha—12th century A.D.
8. Ubhalta (Kashmir).

Editions.—Suśruta Saṁhitā has been edited by Madhusūdan Gupta, Calcutta, 1835; by J. Vidyāsāgar, 3rd Edition, Calcutta, 1889; by A. C. Kaviratna, Calcutta, 1888-95; by Prubhurām Jībanarām, Bombay, 1901; and by Virasvāmī, Madras.

This book has been translated into English in part only by U. C. Datta 1883, A. Chattopādhyāy 1891, Hoernle 1897, Calcutta, in the Bibliotheca Indica. It has been translated into Latin by Hessler and into German by Vullurs.

The book was translated into Arabic before the end of the eighth century A.D. It is called "Kitab-Shawshoon-al-Hindi"

¹ श्रीपद्मनवीरधं सौमुतं पीकलावतम् ।

शेषाणां ब्रह्मन्नाणां मूलाम्येतानि निर्दिशन् ॥

Suśruta Saṁhitā, I. iv.

* श्रीमदनपाददेवदत्तविरचितः श्रीडङ्गलः समभूत् । तेन श्रीजैज्जटं टीकाकारं श्रीमयदासभास्करौ च पञ्चिकाकारौ श्रीमाधवब्रह्म-
देवादीन् टीपनककारौ श्रीपञ्जीयापुर्व्वेदशास्त्रं सुश्रुतव्याख्यानं निबन्धसंग्रहः कियते ।

Dallapa's Commentary, I. i.

and also mentioned as "Kitab-i-Susrud" or Book Suśruta by Ibn Abillsaibial. Rhazes often quotes Sarad as an authority in Surgery.¹

VĀGBHATA I.

The next author of celebrity and whose work is still extant is Vāgbhaṭa I or Vāgbhaṭa the elder, the author of Aṣṭāṅga Saṁgraha (i.e., Compilation of the Octopartite Science). In later times, a namesake of his, wrote another work called Aṣṭāṅga Hṛdaya Saṁhitā (or the best Compendium i.e., the Heart of the Octopartite Science). In the Uttara Sthāna, Vāgbhaṭa the younger distinctly states that his Compendium is based on the Compilation of Vāgbhaṭa the elder.²

As regards the age of Vāgbhaṭa the elder, there is the same uncertainty as with his predecessors. We are however sure that he is posterior to Caraka and Suśruta for he refers to these writers by name.³

The chronological relation of the three early authors is described in a popular couplet that Ātreya, Suśruta and Vāgbhaṭa were the three great medical authors for the three Yugas—

¹ "His next description is from an author named Sarad, whom he frequently quotes in other parts of his works".

Adam's Commentary on Paulus Aeginetta, VI. lxi.

² चरकवैद्यकमहोदधिमन्त्रेण योऽष्टाङ्गसंघनदायतराशिराव ।

तन्नादनल्पलनसमुद्यमाणां प्रीतर्षमेतदुदितं वृद्धमेव तनम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, Uttara Sthāna, Ch. XL, v. 82.

³ By name, e.g. in Saṁgraha, Bombay ed., Vol. I, P. 246; Vol. II, P. 421. Again quoted from Caraka, *Ibid.*, Vol. I, pp. 20, 93; Vol. II, pp. 212, 213, *et passim*; from Suśruta I, *ibid.*, Vol. I, pp. 109, 121, 177, 247; Vol. II, p. 303, *et passim*. (Hoernle).

the Tretā, Dvāpara and Kali, respectively.¹ They are known as the Vṛddha Trayī or the Old Triad. This medical tradition goes much against the conclusion of Dr. Hoernle that Vāgbhaṭa I must have flourished early in the seventh century A.D. One of the reasons put forward by him is the fact, that "the Buddhist pilgrim I'Tsing, who resided ten years in the Nalandā University (in Bihar) from about 675-686 A.D., states in *Records of Buddhist practices* that the eight arts (i.e., the branches of medicine) formerly existed in eight books but lately a man epitomised them and made them on one bundle (or book)."² Professor Jolly understands by it the Suśruta Saṁhitā while Dr. Hoernle points out with more reasons that it refers to Vāgbhaṭa I's work, the Aṣṭāṅga Saṁgraha (i.e., the Compilation of the Octopartrite Science) and rules out Suśruta by the word "lately."³ But the description that I'Tsing gives of the contents of the book does not warrant any reference to either. Moreover, he has not given any reason why Vāgbhaṭa II's book Aṣṭāṅga Hṛdaya Saṁhitā (the best Compendium of the Octopartrite Science) might not be alluded to by I'Tsing. Dr. Hoernle, however, rules him out by date for "he can not be placed earlier than the eighth century"—an assertion unsupported by any evidence whatsoever. All that he has proved is that "Accordingly it is probable that all these three medical writers (Mādhava, Dṛḍhatala and Vāgbhaṭa II) come in the period from the 7th to the

¹ See foot-note 3, P. 6.

² I'Tsing: *Records of the Buddhist Religion*. Transl. by Professor Takakusu, P. 128.

³ J. R. A. S., 1907, P. 413.

Hoernle's *Osteology*, Introduction, P. 10—11.

9th century A.D.¹ at no very great interval from one another," and this proof is based on the age of Vāgbhaṭa I as suggested by I'Tsing's remarks. Thus he has taken for granted what he is required to prove. He has shown that Suśruta is anterior to Vāgbhaṭa I; and Vāgbhaṭa II is posterior to him. But in trying to prove that Vāgbhaṭa I lived in the seventh century he cannot assume that Vāgbhaṭa II lived in the eighth. Another evidence adduced in support of his conclusion is the fact that the non-medical version of the list of bones of the human body as contained in the Law-book of Yājñavalkya presupposes earlier uncorrupted forms of lists of bones both in Caraka and Suśruta, and "the corrupt recension, traditionally handed down, must have come into existence at a later date," that is to say, between the date of Yājñavalkya (350 A.D.) and Vāgbhaṭa I, the latter of whom is proved to have copied from the corrupt recensions of Caraka and Suśruta. Thus the older recensions still existed in the fourth century A.D. and if we add to it the interval of time necessary for the texts to have fallen into a state of corruption, we get the early seventh century A.D. for Vāgbhaṭa I. But we must remember that there is nothing to prevent against the supposition that Vāgbhaṭa I lived before Yājñavalkya. There might have been two recensions of the texts available during Yājñavalkya's time, one corrupted and it might or might not have been the work of Vāgbhaṭa I and another the version which was availed of by the sage Yājñavalkya. And similar events have happened, as has been pointed out by Dr. Hoernle himself, in our own generation. Gaṅgādhara's recension of Caraka is a corrupted form of the text,

¹ *Ibid*, P. 16.

while the recension given in Jībānanda's edition is the traditional text of Caraka. No critic would I think jump into the conclusion that Gaṅgādhar lived three or four centuries after Jībānanda. Again if it be true, as he contends, that Suśruta was redacted by Vāgbhaṭa I, we could easily imagine that Yājñavalkya copied his list bones from the original Suśruta and not from the redaction of Vāgbhaṭa I. So we see that the age assigned to Vāgbhaṭa I, or the seventh century A.D. can not be accepted as proved. Dr. Hoernle says : "It should, however, be understood that these conclusions regarding the date and authorship of Vāgbhaṭa I, are not put forward as established fact."

Let us recapitulate the objections that can be urged against the conclusion that Vāgbhaṭa I lived in the seventh century A.D.

1. Vāgbhaṭa I is believed by the Indian medical men to have flourished long before the Christian era. By some, he is connected with the court of Yudhiṣṭhira, but his name is nowhere mentioned in the Mahābhārata. Ātreya, Suśruta and Vāgbhaṭa are described as the Old Triad or Vṛddhya Trayī and they were the authorities for the Tretā, Dvāpara and Kali Yugas, respectively. It is curious to observe that Dr. Hoernle in arguing against the conclusion of Prof. Jolly that Suśruta is meant by I'Tsing, takes advantage of this Indian medical tradition that Suśruta flourished during pre-historic times, but does not mention the same tradition with regard to Vāgbhaṭa I, which goes against his own conclusion. On the other hand the same objection does not apply against Vāgbhaṭa II.

2. The name of Vāgbhaṭa I's book, Compendium of the

Octopartrite Science, no doubt, agrees very well with the description of ITsing that "lately a man collected them into one bundle." But Vāgbhaṭa II's book "The best Compendium of the Octopartrite Science" is equally suggestive, though Dr. Hoernle says: "it cannot prevail by the side of the more suggestive name of the rival work of Vāgbhaṭa the elder."

3. Again in arguing against Prof. Jolly, Dr. Hoernle has attached much importance to the word "lately" by which Suśruta is ruled out by date. Admitting the validity of such reasoning, it does not follow that by the word "lately" ITsing meant any contemporary author or any one who preceded him by a short period only. To comprehend the meaning of the sentence we must understand the word "lately" in connection with the word "formerly" used before.¹ Now the sentence "The science of medicine formerly existed in eight books" no doubt refers to the division of Āyurveda into eight parts by Brahmā and to the treatises on the different branches of Medicine by Agniveśa, Suśruta and others. These treatises are believed to be of remote antiquity, and so any later compilation may be spoken of as recent in comparison with the old treatises of unknown ages. Thus the word "lately" may refer either to Vāgbhaṭa I or Vāgbhaṭa II, but the latter author's claim to the honour becomes reasonable considering his decided posteriority to the former and so coming within the limit of the time suggested by the word "lately."

4. Again ITsing refers to a book which was recognised as the standard throughout India. This may refer either to

¹ J. R. A. S. 1907. P. 174.

Vāgbhaṭa I or II. But if Vāgbhaṭa I's book occupied such a position at the time of I-Tsing, it becomes difficult to imagine why Vāgbhaṭa II should write another work principally based on the work of Vāgbhaṭa I after a lapse of a century or so. Moreover, we find at the present time, that Vāgbhaṭa II's book, *Aṣṭāṅga Hṛdaya Saṁhitā*, has a wider popularity than the book *Aṣṭāṅga Saṁgraha* of Vāgbhaṭa I. The former has been printed many times and is widely read by the students,—so much so Vāgbhaṭa is generally known as the author of *Aṣṭāṅga Hṛdaya Saṁhitā*.

5. Moreover, the Arabian physician Rhazes, who is said to have lived in the ninth century (882 A.D.) in treating of the property of ginger, the common plantain or musa and other drugs, quotes from an Indian writer, whom he calls Sindaxar or Sindicara.¹ Royle says: "But in the article *De Allio* another Indian author is quoted, whom I have not been able yet to trace out—*Aut Sindifar* (in another place written "*Dixit sindichar*") *indianus* valet contra Ventositatem." This Sindicara is identified with Vāgbhaṭa II of Sindh who was in his time known as a second Caraka or Cara, the syllable "ka" making no difference, as in words like "bāla" and "bālaka," both meaning a child.² We know that the Vāgbhaṭa's *Aṣṭāṅga Hṛdaya Saṁhitā* was one of the medical works translated by the order of Caliphs in the eighth century.³

6. The translations of the Caraka, the Suśruta and the Vāgbhaṭa occur in the Thibetan Tanjur.⁴ "George Huth,⁵

¹ Antiquity of Hindu Medicine, Page 33.

² History of Aryan Medical Science, P. 196.

³ Zeit. deut. morg. Ges. 34, p. 465.

⁴ Jour. Asiatic Soc. XXXVIII. (1835).

⁵ Zeit. deut. morg. Ges. T. (LXIX. pp. 270—284).

who has recently critically examined the contents of the Tanjur, concludes that the most recent date at which it can be placed is the 8th century A.D."¹

So I cannot avoid the conclusion that of the three authors, Suśruta, Vāgbhaṭa I and II, to which ITsing's remarks may refer, the last has probably the best claims to that reference; and the date assigned to Vāgbhaṭa I may well suit Vāgbhaṭa II—i.e., "as late as the early 7th century A.D.,"² and possibly still earlier.³ Again it is impossible for us to say whether ITsing's remarks may not appropriately refer to other authors whose works are lost to us.

Mention should also be made of the fact pointed out by Dr. Cordier that Vāgbhaṭa is mentioned in Rājtarāṅgiṇī and his date is fixed there as 1196-1218 A.D.⁴

But the name of Vāgbhaṭa does not occur in Stein's edition of Rāj, which is no doubt the most reliable, and so we can easily dismiss this view as untenable.

Editions.—Vāgbhaṭa I's book Aṣṭāṅga Saṁgraha has been printed in Bombay.

Commentary.—Aruṇadatta—about 1220 A.D.

¹ P. C. Ray's History of Hindu Chemistry, Intro., P. XXIX.

² Hoernle's Osteology, Intro., p. 10.

³ Dr. Kunte places him "at least as early as the second century before Christ," Vide his Intro. to Vāgbhaṭa's Aṣṭāṅga Hrdaya Saṁhita.

⁴ सिद्धमृतः परमबीडी बागभट्टाचार्यः काश्मीरनगरपति जयसिंहस्य प्रजापालन समये (खुः शाला प्रतान्दाम्, शक १११८—४०) वर्धमाना आसीत् ।

Quoted in Cordier's Vāgbhaṭa et l'Aṣṭāṅga Hrdaya Saṁhita, 1896.

See Intro. to the Vaidyākāśubhasindhu by Kacirāja Umeśandra Gupta, 1894.

VĀGBHATA II.

The next great authority in Hindu medicine is Vāgbhaṭa II, son of Sirīha Gupta, an inhabitant of Sindh.¹ His work, *Aṣṭāṅga Hṛdaya Saṁhitā*, the author himself states, is based on the summary of Vāgbhaṭa the elder.² In the first chapter of *Sūtra Sthāna*, he acknowledges the help he received from the works of Agniveśa, Hārīta, Bhela, and others.³ The fact that Caraka is not referred to here as one of the sources of Vāgbhaṭa II has been taken advantage of by some to prove the posteriority of Caraka.⁴ They conclude that Agniveśa and Suśruta wrote their works long before him, and the Agniveśa Tantra was not called by the name of, and in fact was not as yet edited by, Caraka, at the

- 1 भिषग्धरी नाम्न इत्यमुने
 2 पितामही नामधरीऽस्मि यस्मै
 सुतोऽभवत्तस्य चे हिंस्रगुणः
 तस्याप्यहम् सिन्धुसु जातजन्मा ॥

Aṣṭāṅga.

- 3 *Aṣṭāṅga Hṛdaya Saṁhitā*, Uttara Sthāna, Ch. XL, v. 82.

See foot note 2, p. 18.

- 4 ब्रह्मा स्मत्वाऽऽयुधी वेदं प्रजापतिमजिघृक्षन् ।
 सोऽश्विनौ तौ सहस्राक्षं सोऽक्षिपुमादिकान्मुनीन् ॥३॥
 तेऽग्निवेशादिकास्ते तु पृथक् तन्नाणि तेनिरै ।
 तेभ्योऽतिविप्रकौर्षेभ्यः प्रायः सारसरीययः ।
 क्रियतेऽष्टाङ्गद्वयं नातिमंलेषविकारम् ॥४॥

Aṣṭāṅga Hṛdaya, Sūtra Sthāna, Ch. I.

4 "It would appear also that at the time Vāgbhaṭa lived, Agniveśa's work was not called by the name of Caraka, and Suśruta had also been written. Hence it follows that Caraka's edition of Agniveśa, that is the work now called Caraka, was probably edited after Suśruta had been written."

Dutt's *Materia Medica of the Hindus*, Intro., p. IX.

time Vāgbhāṭa II flourished. The argument is however not conclusive ; it only shows that the Agniveśa Tantra was available to Vāgbhāṭa II in its original form. No definite results can be expected from this *argumentum ex silentio*. Again it may easily be imagined, and I think it is the right view of the question, that Caraka lived and edited Agniveśa's work long before Vāgbhāṭa, the reason of Caraka being not mentioned in Vāgbhāṭa's book, is the fact that Caraka did not usurp the authorship of Agniveśa Tantra but clearly states at the end of each chapter the real nature of his share in the authorship of his book in the following words :—" Here ends the chapter of Agniveśa Tantra as corrected and edited by Caraka." Many modern text books of medicine have been edited and improved, though the books are still called after the original authors. Moreover to make Caraka flourish after Vāgbhāṭa II would bring him to quite modern times.

We are however arguing on false premises. Though Caraka is not mentioned in the Sūtra Sthāna of Aṣṭāṅga Hṛdaya, his name occurs in the Uttara Sthāna.¹ So there can be no doubt that Caraka's edition of Agniveśa was current in India long before Vāgbhāṭa II wrote his Aṣṭāṅga Hṛdaya Saṁhitā.

¹ यदि चरकमधीति तदधुव सुमुतादि

प्रक्षिप्तदितगदानां नाममात्रेऽपि वाच्यः ।

अथ चरकविहीनः प्रक्रियायामखिन्नः

किमिह खलु करोतु व्यधितानां चरकः ॥३८॥

अधिपणीति प्रीतिरेभ्युक्ता चरकमुमुती ।

भेदायाः किं न पश्यान्ते तस्मात्प्रोक्तं सुभाषितम् ॥३९॥

Aṣṭāṅga Hṛdaya Saṁhitā, (Ed. Vijayratna Sen),
Uttara Sthāna, Ch. XL.

Editions.—There are various editions of the book but the following are reliable :—

1. By Dr. Anna Moreśvara Kunte, M.D., 2 vols., Bombay, 1880 ; 2nd Ed., 1891.
2. By Jibānanda Vidyāsāgara, Calcutta, 1882.
3. By Vijayratna Sen Kaviranjana, Calcutta, 1885-90.
4. By Ganeś Sastri Tartevidya, Bombay, 1888.
5. In Sanskrit and Bengali, with the commentary of Arūṇadatta by Vijayratna Sen Gupta, Calcutta, 1888.
6. In Sanskrit and Guzrathi by Behicharlal Nathuram, Ahmedabad, 1889.
7. In Sanskrit and Bengali by Kālīśa Cundra Sen Gupta, Calcutta, 1890-1892.
8. In Sanskrit and Hindi by Pandit Robi Dutta, Bombay, 1890.
9. In Sanskrit and Marathi by Ganeś Kṛṣṇa Garde, Poona, 1891.
10. In Sanskrit and Bengali by *Kavirāja* Binod Lāl Sen, Calcutta, 1891-1892.

*Commentaries.*¹—

1. *Sarvāṅga Sundarī*² by Arūṇadatta, son of Mrgāṅka-datta, 1220 A.D.

¹ See Cordier's *Vāgbhaṭa et L'Asṭāṅgahrdaya Saṁhitā*, P. 6.

² इति श्रीमृगाहदत्तपुत्र श्रीमदहमदत्तविरचितायां
सर्वाङ्गसुन्दराम्बटीकायां * * * * *

2. *Āyurvedadarśayana* (Dinacharyā Prakarana) by Hemadri or Kamadeva, Raja of Devagiri. It is available in parts only.
3. *Aṣṭāṅgahṛdayarddyota* by Aśadhara Sallaxana.
4. *Padārthacandrikā* by Candracandana.
5. *Saṅketamañjarī* by Dāmodara.
6. *Aṣṭāṅga Hṛdayatikā* by Rāmanāth Vaidya.
7. *Vālaprobodhikā* (Anonymous).
8. *Hṛdayabodhikā* "
9. *Pāṭhya*.
10. *Vāgbhaṭartha Kaumudī* by Hari Kṛṣṇa Sen Mullick.
11. *Pradīpa* by Jaśodānandan Sarkār, 1298 B.S.

VĀGBHATA III.

The author of *Rasaratna Samuccaya* in the Colophons at the end of each chapter identifies himself with Vāgbhaṭa II : "Here ends Book first (or so) of R.R.S. composed by Vāgbhaṭa, son of Siṃha Gupta, prince of physician." The salutation at the beginning of his book is strictly Buddhistic. The probable date of the book is "placed between the thirteenth and fourteenth centuries A.D."¹ "The chemical knowledge, as revealed in Vāgbhaṭa is almost on a par with that in the *Suśruta*," whereas the R. R. S. indicates an advanced state of that science. He quotes *Rasārṇava* as a source of his information ; he does not mention opium as a medicine, and the *Firaṅga roga* and its treatment find no place in his book.

¹ P. C. Rāy's *History of Hindu Chemistry*, Intro., p. li.

MĀDHAVAKARA.

He is the author of the famous work on Pathology or Nidāna. His book was translated into Arabic by the order of Harun-Al-Rasid and so the most recent date that can be assigned to him is the seventh century A.D.¹ Thakore Saheb of Gondal identifies him with Mādhavācāryya, the celebrated author of Sarvadarśana Saṁgraha, the brother of Sāyana, the commentator of the Vedas.² I do not find any authority for such an assertion and here is an example of fallacious reasoning based simply on the identity of names. Mādhavācāryya and Sāyana lived in the twelfth century A.D. Mention should also be made of the view expressed by Dr. Hoernle as certain that Mādhavakara, the author of Nidāna and Vṛnda Mādhava, the author of Siddhayoga are one and the same person. He holds that Vṛnda is the real name, but he was known to the commentators as Mādhava, for his melodious diction. There is no proof given of this opinion, and we have reasons for not accepting it. However as he does not treat of surgical instruments, his work is not important to us.

CAKRAPĀṆIDATTA.

Cakrapāṇidatta or more commonly Cakradatta in a Colophon³ has given an account of himself in his book called

¹ Jolly's Indian Medicine, ff. 5, 6, pp. 7-9.

² History of Aryan Medical Science, Ch. II, p. 35.

³ दीक्षाधिनाथ रसज्वाधिकारिपात्र—

नारायणस्य तनयः सुनयीतिरुक्तान् ।

भानीरनु प्रथितजीववलीकुलीनः

दीक्षकपालिरिह कर्तृपदाधिकारी ॥

Colophon in Cakradatta.

Cikitsā Sūra Saṁgraha: "The author of this work is Śrī Cakrapāṇi who belongs to the family of Lodhravali; and who is the youngest brother of Vānu and the son of Nārāyaṇa, the superintendent of the kitchen of Nayapāla,¹ the king of Gour." This book is arranged on the plan of Vṛnda in his Siddhayoga² which again follows closely as a companion volume to Mādhava's Nidāna.³ The age of Cakradatta is about 1060 A.D.; and Vṛnda must have flourished between Mādhava and Cakrapāṇi for he quotes the former while he is himself quoted by the latter. So the probable age of Vṛnda is the ninth century A.D. Besides being a celebrated author, Cakradatta wrote excellent commentaries of Caraka and Suśruta. His extant works are—

1. Cikitsā Sūra Saṁgraha or Cakradatta. A treatise on Medicine.

¹ For the date of Nayapāla, vide Cunningham's Archaeo. Survey of India. III. P. 119; also J. A. S. LX. Pt. I. P. 46. Life of Atisa by S. C. Dās.

² यः सिद्धयोगिस्तथाधिकसिद्धयोगा—

ननेव निचिपति केवलमुद्धरेत् ।

भट्टचर्यविषयवेदविदा जनेन

दत्तः पतेत् सपदि मूर्धनि तस्य शपः ॥

Sloka at the end of the Cakradatta.

य इत्यादीः—सिद्धयोग इति इन्द्रकृतसंस्कृतस्य संज्ञा, तद्विहितयोगमपेक्षयाधिका ये च सिद्धयोगाश्च संसृष्टे सत्तासाधनधिकयोगान् तत्रैव सिद्धयोगे निचिपति, तथा यी वा तानधिकसिद्धयोगानितः संवत्सरादुद्धरेत् दूरीकुर्वेत्, तस्य मूर्धनि मुदशेन पुंसा दणः शपः पतेत् । कीदृशेन पुंसा ? भट्टचर्यविषयवेदविदा । कारिका उद्धरीका चन्द्रटीकेति भट्टचर्यं, विषयवेदः कन्यजुःसामरूपः, तदिदा ॥

Śihadāsa Sen's Commentary.

॥ इन्द्रेण * * * * * संनिवस्यते गदविनिधयक्रमेण ॥

Vṛnda's Siddhayoga.

2. Cakradatta or Materia Medica. It treats on drugs applicable to a number of diseases.
3. Muktabali. This treatise on the nature and properties of medicinal drugs is ascribed to Cakrapāṇi.
4. Vānumati—Commentary on Suśruta Saṁhitā.
5. Cakratattwadīpikā—Commentary on Caraka Saṁhitā.

Editions.—

1. Cakradatta or Cikitsā Sāra Saṁgraha edited by *Kavirāja* Pyāri Mohan Sen Gupta, Calcutta, 1295 B.S.
2. Cakradatta with Bengali translation by Candrakumār Dās Kavibhūṣaṇ.
3. Cakradatta with Bengali translation and with commentary of Śīva Dās Sen, by Jaśodā Nandan Sarkār, 1302 B.S.

• • •
SĀRĀṄGADHARA.

He wrote Sāraṅgadhara Saṁgraha. It is compiled from the works of Caraka, Suśruta, Vāgbhaṭa and others.¹ It is very popular in Western India. It treats on nosology and practice of Medicine. He was the son of Dāmodara and flourished in the fifteenth century A.D.

Edition.—By *Kavirāja* Pyāri Mohan Sen Gupta, Calcutta, 1296 B.S.

¹ प्रसिद्धवीरा मुनिभिः प्रयुक्ता
शिक्षित्सकै र्यै बहुश्रीऽनुमृताः ।
विधीयन्ते ग्राह्यं चरीष तेषां
सुसंगतः सञ्चरन्नुपलभ्य ॥

Commentary.—Sāraṅgadharatikā: It is a commentary on the above work by Adhamulla.

BHĀVA MIŚRA.

About 350 years ago, a compilation was made by Bhāva Miśra, son of Lataka Miśra, an inhabitant of Benares, from the most celebrated medical works and was called Bhāva Prakāśa.¹ He lived about 1550 A.D. and was considered a "Jewel of Physicians and Master of Śāstras." He mentions China root called Tob Chini² in the Vernacular as a remedy of Firaṅga roga or Syphilis³ which he describes for the first time in India. He was the first to make mention of certain drugs of foreign countries as Badhkshani Naspasi,

- ¹ अमुल्लेदाभिन्नादतिमतिमुनवी योगरत्नानि यदा-
 ज्ञाया स्ते स्ते निबन्धेदधुरखिलजन व्यधिविभ्रमनाथ ।
 ततश्च यन्मादृशहीतः सुवचनमोषिभिर्भारमिश्रशिक्षिणा
 शास्त्रे जायान्तकारं प्रशमयितुमिमे सन्निधत्ते प्रकाशम् ॥

Bhāva Prakāśa, I. i.

इति श्रीमिश्र लटकतनय श्रीमन्निद्रभावरचिते
 भावप्रकाशे षष्ठ प्रकरणे सम्पूर्णं ॥

Colophon at the end of Section I.

- ² हीपान्तरवचा किञ्चित्तीक्ष्णा वज्रदौमिहन् ।
 विवस्वाद्यानग्लह्रीं शक्रन्दूचविश्रीधिनी ॥
 वातव्याधीनपश्मारमुन्नादं तनुवेदनाम् ।
 व्यपीडति विशेषेण फिरङ्गामवनाशिनी ॥

Bhāva Prakāśa, I. i.

- ³ फिरङ्गसंज्ञके देशे वाहुल्येनैव यद्वेत् ।
 तस्मान् फिरङ्ग इत्युक्ती व्याधिर्वाधिर्विशारदैः ॥

Bhāva Prakāśa, II. iv.

Khorasani and Parasika Vacha (*Acorus Calamus*), Sulemani Khārjura (date fruit of Suleman),¹ and opium.

Editions.—

1. By Jibānanda Vidyāsāgara, Calcutta, 1875.
2. By Rasik Lāl Gupta.
3. By Kālīśa Candra Vidyāratna.

Besides these books, the number of Sanskrit medical works is simply legion; many of them are daubed with fancy names and are excellent treatises on the different branches of medical science. But they are quite foreign to our purpose. I intend to publish in a separate volume short notices of the medical authors and their works, and so we need not dwell on them here.

. . .

- ¹ पारसीक वचानी तु यवानी सदृशी गुणैः ।
विशेषात् पाचनी रुच्या साहिष्ण्वी मादिनी मुखः ॥

Bhāva Prakāśa, I.

पारसीकवचा युक्ता प्रोक्ता हेमवतीति सा ।
हेमवत्युदिता तद्वर्णं हनि विशिष्यतः ॥

Ibid.

उक्तं खसफलचौरमापूकमहिफेणकम् ।

Ibid.

चीनाक सन्नः कपूरः कफक्षयकरः कृतः ।

Ibid.

खर्जुरी गीमनाकारा परबीपादिहानता ॥

Ibid.

CHAPTER II.

HOSPITALS AND DISPENSARIES.

Before entering into our proper subject, it would not be amiss to notice here two objects—Hospitals and Anaesthetics—which are essentially necessary for the development of surgical knowledge. We know from the Edict II of Aśoka that India during his reign was studded with hospitals not only for the treatment of human beings but also for the brute creations. But even before Aśoka, hospitals flourished in India. In Caraka we can trace the germ of such an institution though it was used for rich men and did not accommodate the public.¹

¹ इदं निवर्त प्रवर्तकदेशं सुखप्रविचारमनुपलब्धं धूमातपरजसामनभिगमनीयमनिदानाच्च
मृद-सर्ज-रस-कप-न-स्थानां सीपानीदू-मलमुपलवर्ध-न्यान्स्नानभूमिमिहानसीपेतं वास्तुविद्या-
कुशलः प्रशस्तं मृदमेव तावत् पूज्यमुपकल्पयेत् ।

ततः शैलशौचानुरागदाह्यप्रादक्षिणीपपन्नानुपचारकुशलान् सन्ध्याकर्मसु पर्यवदत्तान्
सूपीदनपाचकसापकसंवाहकोत्थापकसंवेगकोषधपेषकाश्च परिचारकान् सन्ध्याकर्मसुप्रति-
कुलान् । तथा सीतनादिक्रीडापकश्रीकणाद्याध्यायिकैतिहास-पुराणकुशलानामिषाय-ज्ञाननु-
सर्ताश्च देशकालविदः परिषदाश्च । तथा लावकपिण्डलशशहरिणैककालपुच्छकमृगमाहको-
रमान् । ग्राह्यदोम्यौ शैलवतीमनातुरा जीवहत्सां सुप्रतिविहितलक्षशरस्यपानीयम् । जल-
पाचाक्षमनीदकीहमणिकपिठरघटकुक्षीकुक्षकुशशरावदर्थीकपरीपचनमन्यागवेलधूपकापसी-
र्षादीनि च शयनासनादीनि चोपन्यस्यसङ्कारप्रतिषङ्गाणि सुप्रयुक्तात्तरणीतरप्रच्छदो-
पधानानि स्नापाश्रयानि सवेशनीपवेशनसंवेहस्तेदाभ्यङ्गप्रदेहे परिषेकानुलेपनवननविरेचना-
स्नापनानुवासन-शिरोविरेचनमुषोधारकर्मणामुपचारसुस्नानमुपशान्तिपधानाञ्च द्रव्यसंर-
मन्यमा इन्द्र शस्त्राणि चोपकरणार्थानि ।

धूमनेत्रं वस्त्रनेत्रञ्चोत्तरवस्त्रिकञ्च । कुशहस्तञ्च तुलाञ्च भातभालञ्च घृततैलवसामञ्चचोद-
क्राणितलवधेनवीदक-मपुसुरासौवीरकतुषीदकमैरयमेदकदधिमण्डोदग्निद्वानाश्वमुवाचि च ।
तथा शालिषटिकमुद्रमाषयगतिलकुलव्यवदरमृद्वीक्षापदयकामयामजकविभीतकानि नाना-
विधानि च संवेहस्तीदापकरणानि द्रव्याणि तद्वेशीदंहरणानुजीनिकीमयभावि संयहनीयदीप-
नीयपाचनीयोपशमनीयवातहराणि समालातानि चोपधानि यथाग्न्यदपि किञ्चिदापदः
परिसंख्यायोपकरणं विद्यते यच्च प्रतिभोगार्थं तत्तदुपकल्पयेत् ॥

He advises us as follows:—The engineer is to erect a strong and spacious building, well-ventilated at one part, the other part being free from draughts. The scenery should be pleasing and one should feel happy to walk in it. It must not be behind any high building, nor exposed to the glare of the sun. It should be inaccessible to smoke and dust. There must not be anything injurious to our senses as regards sound, touch, taste, form and smell. There should be stairs, large wooden mortars and pestles; and there must be additional bare ground for the construction of a privy, bath-room and kitchen. The staff should consist of servants and companions. The servants should be good, virtuous, pure, fond, clever, generous, well trained in nursing, skillful in works, able to cook rice and curries well, competent to administer a bath, expert masseur¹, trained in raising and moving a patient, dexterous in making or cleaning beds, practiced in the art of compounding medicines and willing workers not likely to show displeasure to any order. The companions should be good singers and musicians, fluent speakers, well-versed in distichs, ballads, tales, history and mythology, well-acquainted with the design of a patient's nods or signals, agreeable and should have knowledge of the season and the locality. The various kinds of animals

¹ From the accounts of Megasthenes, we learn that four attendants used to massage him (Candragupta) with ebony rollers during the time that he was engaged in disposing of cases. Such an attendant (*sañivāhaka*) is a minor character in the Toy Cart or little Clay Cart, drama, transl. by Ryder, in Harvard Oriental Series, Vol. IX, 1905—Smith's Early History of India, 2nd Ed., Page 122. Footnote. We also find in the Kāmandikya Nitisāra that the king is cautioned against shampooers who have the opportunity of poisoning him.

सृष्ट्यङ्गनकर्तारस्तल्पका व्यवसायाः ।

प्रसाधका भोजकाश्च गानसंवाहका अपि ॥

should always be kept in stock such as Lāva (*Perdix Chinensis*), Kapinjala (partridge), hares, sheep and the different kinds of deers, Ena (the black antelope) blacktailed deer, and Mṛgamāṭṛka. There should be a dairy attached to the building. The cow should be good natured and healthy, and should yield profuse milk. The calves must be living. There should be stocked for them potable water and hay in a clean fold. In that building must be kept the following necessary articles:—

Water vessels, washing basins, tubs, jars, dishes, ghata, (small jars) kumbhī, kumbha (larger and smaller vessels), kundu (jug or pitcher), soraba (earthen basins), spoons or ladles, cooking utensils, churning rods, cloth, thread, cotton, wool, bedding and āsana (seats). Near them should be placed drinking vessels of gold and spittoons. The bedding should consist of a broad carpet, bed-sheet, pillows, and a bedstead. There should be collected good furnitures for beds and seats; and also utensils and appliances for application of oleaginous medicines, heat, oil, ointment, bath and perfumeries, and for the acts of emesis, purgation, draining of the brain, injection into the rectum, defaecation and urination (i.e. Vastī-yantra, urinal, bed-pan &c.). The blunt and sharp instruments and their accessories, well-washed mullers and whetstones of different degrees of smoothness—polished, plain or rough—should be near at hand; the tubular instruments for fumigation, inhalation and injection into the rectum, urethra and vagina, should be available there; and the following articles are also to be stocked:—brushes and brooms, weighing scales and weights, ghee (melted butter), oil, fat, marrow, honey, molasses, salt, wood, water, spirituous liquor formed by steeping husked grains of barley in water, or by boiling together the husks of fried māṣkalāya

(pulse of Phaseolous Rox.), barley and water, spirituous liquor from the blossoms of *Lythrum Fruticose* with sugar, spirit distilled from the different sorts of grains, curdled milk, rice, gruel, whey, sour liquid produced from the acetous fermentation of powdered paddy, and the various kinds of urines of animals. Different kinds of rice such as *Śali* (or that reaped in cold season) and *Saṣṭhika* (or that grown in hot weather in low lands and reaped within sixty days of its sowing), *Mudga* (*Phaseolus mungo*), *Māṣa* (*Phaseolus Rox.*), *Yava* (*Hordeum Vulgare*), *seasame* (*Seasamum Indicum*), *Kullatha* (*Dolichos Biflorus*), *plums* (*Zizyphus Jujube*), *raisins* (*Vitis Vinifera*), *Paruṣa* (*Grewia Asiatica*), *Abhayā* (*Chebulic Myrobolan*), *Āmlakī* (*Phyllanthus Emblica*), *Vibhītaka* (*Terminalia Bellerica*) and other classes of medicaments, as oils, diaphoretics, sternutatories, cathartics, emetics, purgatives, astringents, stomachics, digestives, ~~calcinatives~~, carminatives and various other forms of medicines, are required for treatment. Besides these, there must be stored the antidotes to poisons caused by overdoses of medicines and other appliances likely to add to the patient's comfort.

To this may be compared the description of the Greek iatrium, which is mentioned in the Hippocratic treatise, *De Medicis*. He directs that "it should be so constructed that neither the wind nor sun might prove offensive to the patient, and goes on to enumerate the various articles which it should contain, such as scalpels, lancets, cupping-instruments, trepans, raspatories, with bandages and medicines." ¹

¹ Works of Hippocrates, Syd. Soc. Vol. II. page 470; Footnote.

Suśruta gives us a list of appliances¹ required in surgical operations:—

1. Blunt Instruments. 2. Sharp Instruments. 3. Potential Caution. 4. Actual Caution. 5. Śālākā or rods. 6. Horns. 7. Leeches. 8. Hollow bottle gourd. 9. Jāmbav-onṣṭha [a bougie of blackstone, the extremity of which is shaped like the fruit of the Jambul tree (*Urginea Jāmbolana*)]. 10. Cotton. 11. Pieces of cloth. 12. Thread. 13. Leaves. 14. Materials of bandaging. 15. Honey. 16. Ghee, or clarified butter. 17. Suet. 18. Milk. 19. Oils. 20. Tarpan.—flour of any perched grain or condensed milk etc. mixed with water to mitigate thirst. 21. Decoctions. 22. Liniments. 23. Plasters. 24. Fan. 25. Cold and hot water. 26. Iron pans, kalasi and other earthen vessels; beddings and seats. 27. Obedient, steady and strong servants.

. . .

The Lying-in-room.—Caraka says: "Before the ninth month of pregnancy, the lying-in-room should be constructed. The land should be cleaned of bones, gravels and potsherds. The ground selected should be of auspicious colour, taste and smell. The gate of the house should face towards the east or the north.² There must be a store of wood such as *Vilva* (*Ægle*

¹ अतोऽनामतं कथं चिकीर्षता त्रेयेन पूर्वमेवोपकल्पयितव्यानि तद्वया यन्मयस्यारादि-
मन्त्राकायजलोकावावृजाम्बोदपिबुध्रीतम्बपपमधुसूतवसापयमेतत्पनकपायलेपन कल्म-
लजननीतीक्ष्णदक कटाहदीनि पारिकर्षणश्च दिग्भाः स्थिरा वलवनाः।

Suśruta Saṁhitā, I. v.

² "The best sort of ground should abound with milky trees, full of fruits and flowers; its boundary should be of a quadrangular form, level and smooth, with a sloping declivity towards the east producing a hard sound, with a stream running from left to right, of an agreeable odour, fertile, of an uniform

Marmelos, Tinduka (*Diospyros Embryopteris*), Inguda (*Balanites* Rox.) Bhallākaka (*Semecarpus Anacardium*), Vāruṣa (*Ocimum Basilicum*), Khadira (*Acacia Catechu*) or wood of other kinds said to be auspicious by a Brāhman versed in the Atharvaveda; and there must be a sufficient provision for clothes, liniments, and covers. For the pregnant woman, be careful to have a fire-place, water, pestles and mortars, a privy, a bathing place, and ovens. These should be constructed according to the science of engineering and should be pleasant with regard to the season. There should be collected clarified butter, oil, honey, different kinds of salts as rock salt, sonchal salt, and black salt, Viḍaṅgas (*Embelic Ribes*), treacle, Kuṭṭha (*Saussurea Lappa*), Kilima (*Pinus Deodara*), Nāgara (dried root of *Zinziber Officinale*), Pippali (*Piper Longum*), its root, Hastipippali (*Scindaspus Officinalis*), Mandukparni (*Hydrocotyle Asiatica*), Elā (*Eleptarium Cardamomum*), Lāngoli (*Gloriosa Superba*), Vāca (*Acorus Calamus*), Cavya (*Piper Cava*), Chitraka (*Plumbago Zeylanicum*), Chiravilva (*Pongamia Glabra*), Hingu (*Ferrula Assafetida*), Sarṣapa (Mustard seeds), Laṣuna (*Allium Sativum*), finely or thickly powdered rice, Kadamba (*Anthocephalous Kadamba*), Ātasi (*Linum Usitatissimum*), Vallija (*Cucurbita Pepo*), Bhurya (*Betula Bhojpatra*), Kulatha (*Dolichos Uniflorus*), Maireya (a spirituous liquor from the blossoms of *Lythrum Frutecoscence*) and Āshava (Vinous fermented liquor from sugar or molasses, Rum). Also collect two pieces of

colour containing a great quantity of soil, producing water when dug to the height of a man's arm raised above his head, and situated in a climate of moderate temperature."

Manosara, Ch. I. quoted in Ram Raz's *The Architecture of the Hindus*, Page 16.

stone (muller and stone slabs), two pestles, two mortars, an ass, a bullock, two sharp needles of gold and silver, two skeins of threads, sharp instruments of steel, two wooden bedsteads (*Ægle Marmelos*), and wood (*Tinduka* and *Ingudi*) for easily igniting fire. The female attendants should be mothers of children, and friends and relatives of the patients. They must be fond of her, skillful in work, intelligent, jolly, laborious full of tender love for the children and a favourite of the mother."¹

The Child's Room:—He continues—"The engineer is to construct a room, spacious, beautiful, full of light, well-ventilated but free from draughts, strong, and free from beasts of prey, animals with fangs, mice and insects. There should be kept water, mortar and separate places should be assigned for bathing, cooking, urination and defecation. It should suit the season of the year. The beddings, seats and covers should be comfortable and suitable to the season. Auspicious ceremonies should be performed in that room such as *homa*, expiations and presents to gods, for the proper protection of the child; and there should be present pious old men, doctors, and devoted

१ प्राक् वेवासा नवमान्धासान् सुतिकागारं कारयेदपहतास्त्रिशर्कराकपालिदैश्च प्रसक्तपरसगन्धाद्यै भूमौ प्राग्द्वारमुदग्द्वारं वा । तत्र वेवानां काष्ठानां तन्दुकैर्हुदानां मन्त्रात्कानां वाक्कानां छदिरानां वा यानि चानान्यपि ब्राह्मणाः श्लेष्टपुरुषैर्वेदविदसहस्रान्निपनाह्वानादिधानसम्पदुपेतं तत् । वायु-विद्या-हृदययीमेनाप्रिसलिलोलुखलवर्षः स्थानस्नानभूमि-महानसमनुसुखं च । तत्र सर्पिलेनपुमेन्धवसौवर्चलकाललवणविद्वग्गुरुकुलकलिमनार-पिपलीमूलहसिपिपलीमखूपणोलालाद्वलीवचापञ्चचिकचिरिविल-हिकुम्भं च स्युनकन-कनिकानोपातसौवर्चलभूज्यैः कुलत्थमैरिवसुरासवाः सन्निहिताः सुराः ॥ यथाग्नीनी ही हे चक्षुर्मूषले हे शूलखले खरी इषभश्च ही च तीक्ष्णौ सूचीपिपलीकौ सौवर्चलखली हे जम्बानि च तीक्ष्णदन्तानि ही च विल्वमयी पथ्येही तन्दुकैर्हुदानि काहन्प्रिसमुच्चानि स्त्रियश्च बह्वी बहुजः प्रजाताः सौहाईयुक्ताः सततमदुरक्ताः प्रदक्षिणाचाराः प्रतिपतिकुञ्जलाः प्रकृतिवत्सलान्यकविधादाः क्लेशमहिषवीर्यमिमता ब्राह्मणायार्थवेदविदो यथावदपि तत्र समर्थं मन्त्रैश्च ब्रह्मणाः ब्रुवुः स्त्रियश्च इहास्तुकार्यम् ॥

attendants constantly. The child's bed, covers and sheets should be soft, light, pure and scented. These should always be free from sweat, dirt, worms or bugs, urine and feces. If repeated change of new clothes be impossible, the soiled coverings should be well washed and the beddings well purified with steam and thoroughly dried before they are used again. To purify or sterilise the dress, beddings, coverings and sheets by fumigation use the following medicines with clarified butter:—Barley (*Hordeum Vulgare*), mustard seeds, linseeds, assafoetida, Guggula (*Balsamodendron Mukul*), Vāca (*Acorus Calamus*), Coraka (*Andropogon Acicularis*), Vayasthā (*Chebulic Myrobolan*), Golomi (*Panicum Dactylon*), Jaṭilā (*Nardostachys Jatamansi*), Palankaṣā (a variety of Guggula), Aśoka (*Saraca Indica*), Rohiṇī (*Picrorrhiza Kurroa*) and sankes' skin.....A variety of toys to please the child should be at hand and these should be coloured, light, musical, beautiful and must not be sharp pointed. They should be of such a size and shape as cannot be put into the child's mouth or do not terrify or kill the child."¹

¹ अतोऽननरं कुमारगारविधिमनुष्याख्यास्यामः ॥ बान्धुविद्याकुशलः प्रशस्तं रम्यमतमकं निवातं प्रवातैकदेशं हृदयमननत्रपापदयदं हिमूधिकपतङ्गं सुसंविमलसलिलोदुखलमूववर्चः-
स्नानस्नानभूमिमहानसस्तुमुखं यद्यनुं शयनासनाक्षरणसम्पन्नं कुर्यात् । तथा सुविहित-
रक्षाविधानवलिमङ्गलहीमप्रायश्चित्तं यच्चिह्नवैद्यानुरक्तजनसम्भूषणमिति । कुमारगारविधिः ॥
शयनाक्षरणप्रावरणानि कुमारस्य सदुल्लुपचिसुगन्धौनि स्युः । स्वेदमलजनुमनि मूत्रपुरी-
षीपस्रवणानि च वज्र्यानि स्युः ॥ असति मयवेऽग्न्येषां तान्मेव च सुप्रचालितपीधानानि
सुधूपितानि सुशुद्धयन्काष्ठुपयोमे मण्ड्येयुः । धूपनानि पुनर्वसुमां शयनाक्षरणप्रावरणानाञ्च
यवसर्वपातसौहिहृदुगुग्गुलवचाचीरकवयः स्वागोलीमीजटिलापलङ्काशीकरोहिषीसर्पनिर्झाकानि
धृतमग्नयुक्तानि स्युः ॥ मणयय धारणीयाः कुमारस्य खड्गहगवयवभानां
जीवतामेव दक्षिणेयी विधाशेभ्योऽद्याचि सहीतानि स्युः । मन्वाद्यावीपययी जीवकर्षभकौ
च वान्यप्यनानि ब्राह्मणाः प्रशंस्युः । क्रीडनकानि खल्वस्य तु विचित्राणि घोषवन्धमिरा-
माणि चतुर्मुखतौष्ठादानि चनास्वप्नवेष्ट्रीनि चप्राणहराणि चविनासनानि स्युः ॥

Suśruta directs that there should be a particular room provided for patients who have undergone surgical operations.¹ "Patients suffering from surgical diseases as inflammatory swelling, wounds &c. should, from the very commencement of their illness, confine themselves inside a clean house, situated in a wholesome locality, free from draughts and not exposed to the glare of the sun. For, in such a building, constitutional, mental and accidental diseases are not likely to occur. In that room, the bed for the patients should be soft, spacious, and well-arranged. The patient should lie down, his

¹ अथिनः प्रथममेवागारमन्विच्छेत्तथागारं प्रशस्तवाक्तादिकं कार्यम् ।

प्रशस्तवास्तुनिर्गृहे सञ्चावातपवर्जितम् ।

निवाते न च रोनाः शुभः शरीराननुमानसाः ॥

तस्मिन् शयनमसम्बन्धं स्नासीये मनीषां प्राक्शिरस्कं सशस्त्रं कुर्वीत ।

सुखचैष्टाप्रचारः स्यात् स्नासीये शस्त्रे व्रतौ ।

प्राच्यां दिशि स्थिता देशस्तत्पूजार्थं नतं शिरः ॥

तस्मिन् सुहृद्विरनुकूलैः प्रियम्बदैरुपास्यमानी यथेष्टमासीत् ।

सुहृदी विचिपन्त्याश्च कथाभिर्गणवेदनाः ।

आशवासयन्ती बहुशस्तनुकूलाः प्रियम्बदाः ॥

न च दिवान्द्रावश्यः स्यात् ।

दिवास्तथादुर्ध्वं कच्छ्मृताणां गौरवं तथा ।

अयमुर्ध्वं दनारामः सावयेव शर्म भवेत् ॥

उत्थानसंवेक्षणपरिवर्तनचक्रमर्णोच्चैर्भाषणादिषु चाकचैष्टासप्रमती व्रथं संरचेत् ।

स्नानासनं चक्रमर्णं यानयानातिभाषणं ।

वृषवाग्नं निषेवेत शक्तिमानपि मानवः ॥

उत्थानादासनं स्नानं व्रथां चातिनिषेविता ।

प्राप्तुयान्नाहतादग्ने रुजस्तस्मादिवर्जयेत् ॥

सन्ध्यायाश्च स्त्रीणां सन्दर्शनं सन्ध्यापक्षसंस्पर्शनानिदूरतः परिहरेत् ।

head pointing towards the east, and keep there some weapon for his own protection. On such a bed, the patient can lie comfortably and turn to his sides at pleasure. He should be surrounded by his dear friends, for their sweet words relieve the pain of inflammation. The female friends, however, should be avoided and kept at a distance. He should observe strictly the orders of the surgeon as regards his food, drink and mode of living. He should have his hairs clipped and nails pared short, be pure in his person, put on white clothes and devote himself to religious duties. A light should be kept burning; and garlands of flower, weapons &c., should be provided in the room to ward off the demons. He should be cheered and inspired by pleasant stories; and the physicians and the priests should attend the patient morning and evening. Pastils made of *Sinapis Nigra* and *Azadirachta Indica* with clarified butter and salt, should be burnt in the room morning and evening for ten days continually. The inflamed part should be fanned with a *cāmar* or yolk-tail. Sleep during the day, exercise and sexual intercourse must on no account be indulged in."

Saṣruta also describes the kitchen of the king thus:—
 "That is the proper kitchen which is built on good ground, towards an auspicious quarter, full of utensils for cooking, spacious, clean, provided with windows guarded by a network, frequented by friends, cleared well of grass furnished with a canopy, purified by auspicious ceremonies, and managed by men and women of good character. The superintendent of the kitchen should, like the doctor, be noble and virtuous. The cook and servants should be pure, noble, capable, mild, good looking, engaged in their respective duties, high-minded, should have their hairs and nails cut short, steady,

well-bathed, of subdued passion, well-dressed, obedient and have their heads well-covered."

"The doctor in charge of the kitchen should be of noble family, religious, friendly, a clever manager for getting king's food properly prepared, ever careful for his health, non-avaricious, simple, fond, grateful, good-looking, cool-tempered, well-behaved, not proud and envious, laborious, of subdued passion, forgiving, pure, of good character, kind, intelligent, not easily fatigued, always loving, well wisher, capable, bold, clever, skillful, not unreasonably tender, provided with medicines and well proficient in the art of healing."¹

- ¹ कुलीनं धार्मिकं शिष्यं सुमतं सततोत्थितं ।
 अलम्बं अष्टं भक्तं कृतव्रं प्रियदर्शनं ॥
 क्रीडपारुष्यमात्सर्यं मदालसा विवर्जितं ।
 जितेन्द्रियं अमाचलं शुचिं शीलदयान्वितं ॥
 मेधाविनमसंशालमनुरक्तं हितैषिणं ।
 पटुं प्रगल्भं निपुणं दत्तं मायाविवर्जितं ॥
 पूर्वोक्तैश्च गुणैर्बुद्धं मित्य' सन्निहितागदं ।
 महानसे प्रयुज्येत वैद्य' तद्विद्यपूजितं ॥
 प्रशसादिर्गृह्यकृतं शुचिभाण्डं मङ्गशुचि ।
 सज्जालकं गवाक्षाढ्यं मात्मवस्त्रं निषेधितं ॥
 विकचसूटसंछटं सवितानं कृतार्चनं ।
 परीक्षितं क्रीपुरुषं भवेत्तापि महानसं ॥
 तत्राध्यक्षं निपुण्यैतं प्राचीं वैद्यगुणान्वितं ।
 शुचयो दक्षिणा दद्यात् विनोताः प्रियदर्शनाः ॥
 सविभक्ताः सुमनसो नौच केशनखाः स्त्रियाः ।
 खातादृष्टः संयमिनः कृतोष्णीपाः सुसंयुताः ॥
 तस्याचाज्ञा विधेयाम्ना विविधाः परिकर्म्मिणः ।
 आहारस्त्रित यथापि भवन्ति प्राणिनो यतः ॥
 तन्मात्रमहानसे वैद्यः प्रसादं रक्षितो भवेत् ।
 माह्वानसिक वीदारः सौवीरदमिक पीपिकाः ॥
 भवेयुर्धैर्यवशना ये चाप्यन्ये तु केचन ।
 इदितद्वी मनुष्याणां वाक्चेष्टमुखवैकलेः ॥

In the *Kāmandakiya Nītisāra*, we find the king advised to take thoroughly examined food, and to be surrounded by physicians well-versed in the science of Toxicology;¹ and again it is said that king should take his medicines, cordials, and edibles after having his medical attendants tasted them.² The king is advised to kill his enemy by weaning over his physician or by administering poisonous liquids.³

In the *Mahāvägga*⁴ we find the qualities of a good patient and a good nurse described:—

“ 6. What are five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon—

When he does do what is good for him ; when he does know the limit (of the quantity of the food) that is good for him ; when he does take his medicine, when he does let a nurse who desires his good, know what manner of disease he has, or when he is getting worse that that is so, or when it is getting better that that is so ; and when he has become able to bear bodily pains that are severe, sharp, grievous, disagreeable, unpleasant and destructive to life. These are the five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon.

¹ विषद्वैरुदकैः खातः विषघ्ननिभूषितः ।

परीक्षितं समद्वीयाञ्चाकुलाविद्विषग्रहतः ॥ १० ॥

Kāmandakya Nītisāra vii. v. 10.

² औषधानि च सर्वानि पानं पानीयमेव च ।

तत्कल्पकैः समान्नाद्य प्राद्वीयाद्भोजनानि च ॥ २७ ॥

Ibid. vii. v. 27.

³ भिषग्भेदेन वा शत्रुं रसदानेन साध्यते ॥ ७० ॥

Ibid. IX. v. 70.

⁴ *Mahāvägga viii. 26, 6 & 8 (Sacred Books of the East).*

8. There are five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task—when he is capable of prescribing medicines; when he does know what (diet) is good and what is not good for the patient, serving what is good and not serving what is not good for him; when he does wait upon the sick out of love, and not out of greed; when he does not revolt from removing evacuation, saliva or vomit; when he is capable of teaching, inciting, arousing and gladdening the patient with religious discourses. These are the five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task."

There is also good deal of evidence to show that medicines were distributed free to the poor and to the pious men. When Visakhā asked for eight boons of the Buddha, she mentioned amongst them the privilege of bestowing her life long "food for the sick, food for those who wait upon the sick and medicines for the sick" and explained her reasons as follows¹ :—

"9. Moreover, Lord, if a sick Bhikkhu does not obtain suitable foods, his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the diet that I shall have provided for the sick neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the *Samgha* my life long with diet for the sick.

Moreover, Lord, a Bhikkhu who is waiting upon the sick if he has to seek out food for himself, may bring in the food (to the invalid) when the sun is already far on his course, and he will lose the opportunity of taking his food. But when

¹ *Mahāvaggā* VIII, 15-9.

he has partaken of the food I shall have provided for those who wait upon the sick, he will bring in food to the invalid in due time and he will not lose the opportunity of taking his food. It was this circumstances, Lord, that I had in view in desiring to provide the Samgha my life long with food for those who wait upon the sick.

10. Moreover, Lord if a sick Bhikkhu does not obtain suitable medicines his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the medicines which I shall have provided for the sick, neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Samgha, my life long with medicines for the sick."

The Edict No. II of Aśoka clearly shows that charitable institutions were common in India, during his reign. The Edict runs as follows:—

"Everywhere in the kingdom of the king Piyadasi, beloved of the gods, and also of the nations who live in the frontiers such as the Cholas, the Pandyas, the realms of Satyaputra and Keralaputra, as far as Tambapani, (and in the kingdom of) Antiochus, king of the Greeks and of the kings who are his neighbours, everywhere the king Piyadasi, beloved of the gods, has provided medicines of two sorts, medicines for men and medicines for animals. Wherever plants useful either for men or for animals were wanting they have been imported and planted. Wherever roots and fruits were wanting, they have been imported and planted. And along public roads, wells have been dug for the use of animals and men."

We also learn from Hsuen Tsang's account that Śīlāditya II

(610 - 650 A. D.) was inclined towards Buddhism and he forbade the slaughter of living animals, built *stupas*, and "in all the highways of the towns and villages throughout India, he erected hospices, provided with food and drink, and stationed there physicians with medicines for travellers and poor persons round about, to be given without any stint."¹

He also mentions about the father of the Bhikkhu Śrutaviṃśatikoti, that "from his house to the snowy mountains, he had established a succession of rest-houses, from which his servants continually went from one to the other. Whatever valuable medicines were wanted, they communicated the same to each other in order, and so procured them without loss of time, so rich was this family."²

He also mentions charitable institutions called *Punyaśālās* as common in India. "There were formerly in this country (Tsch-kia-Takka) many houses of *chārity* (goodness or happiness, *Punyaśālās*) for keeping the poor and the unfortunate. They provided for them medicines and food, clothing and necessities; so that travellers were never badly off."³

Again he says: "Benevolent kings have founded here (Mo-ti-pil-lo or Matipura) a house of "merit" (*Punyaśālās*). This foundation is endowed with funds for providing choice food and medicines to bestow in charity on widows and bereaved persons, on orphans and the destitute."⁴ A similar *Punyaśālā* or hospice was in K'ei-P'an-to (Kabandha).⁵ In describing

¹ Beal's Record, Vol. I, p. 214.

² *Ibid*, Vol. II, p. 188.

³ *Ibid*, Vol. I, p. 165.

⁴ *Ibid*, Vol. I, p. 198.

⁵ *Ibid*, Vol. II, p. 303.

Multan he says: "They have founded a house of mercy (happiness), in which they provide food, and drink, and medicines for the poor, and sick, affording succour and sustenance."¹ Of Śilāditya he says: "Every year he assembled the Sramanas from all countries, and on the third and seventh days he bestowed on them in charity four kinds of Alms (*viz.*—food, drink, medicine, clothing)."²

Fa Hian (405-11 A.D.), a contemporary of Candragupta Vikramāditya, describes the charitable dispensaries in the town of Pātāliputra thus:—"The nobles and householders of this country have founded hospitals within the city to which the poor of all countries, the destitute, cripple and the diseased may repair. They receive every kind of requisite help gratuitously. Physicians inspect their diseases, and according to their cases order them food and drink, medicines or decoctions, every thing in fact that may contribute to their ease. When cured, —they depart at their convenience."³ Smith remarks: "No such foundation was to be seen elsewhere in the world at this date; and its existence, anticipating the deeds of modern Christian charity, speaks well both for the character of the citizens who endowed it, and for the genius of the great Aśoka whose teaching still bore such wholesome fruit many centuries after his decease. The earliest hospital in Europe the Maison Dieu of Paris, is said to have been opened in the 7th centuries."⁴

"Upatisso, son of Buddha Das, builds Hospitals for cripples,

¹ Beal's Record, Vol. II, p. 274.

² *Ibid.*, Vol. I, p. 214.

³ *Ibid.*, Vol. I, Intro. lxi.

⁴ Smith's Early History of India, 2nd Ed., p. 280.

for pregnant women, and for the blind and diseased.¹ Dhatushena builds Hospitals for cripples and sick². Buddha Das³ himself ordained a physician for every ten villages on the high road, and built assylums for the crippled, deformed and destitute."⁴

The animal Hospitals or Piñjrāpoles which still exist at Ahmedabad, Surat, and Sodepore in Bengal, and elsewhere may be regarded as the survivals of the institutions founded by the Maurya monarch. The following account of the Surat Hospital in the 18th century is from the pen of Hamilton:—

"The most remarkable institution in Surat is the Banyan Hospital, of which we have no discription more recent than 1780. It then consisted of a large piece of ground enclosed by high walls, and sub-divided into several courts or yards for the accomodation of animals. In sickness they were attended with the greatest care, and here found a peaceful assylum for the infirmities of old age.

"When an animal broke a limb, or was otherwise disabled, his owner brought him to the Hospital, when he was received without regard to the caste or nation of his master. In 1772 this hospital contained horse, mules, oxen, sheep, goats, monkies, poultry, pigeons, and variety of birds; and also an aged tortoise, which was known to have been there seventy-five years. The most extraordinary ward was that appropriated for rats, mice, bugs, and other noxious vermins for whom suitable food was provided."⁵

¹ Mahāwanso, p. 249.

² *Ibid.* p. 245.

³ *Ibid.* p. 256.

⁴ Cunningham's *Bhilsa Topes*, p. 54, foot note.

⁵ Hamilton's *Description of Hindustan* (120) Vol. I, p. 718, quarto ed., Crooke. *Things Indian*, Art. Pinjrapole, (Murray 1906).

We quote here from Hemādri the opinions of the sages and the Purāṇas as to the merit of the founder of a hospital¹ :—

Visvāmitra.

There is no gift more precious than the gift of cure ; therefore it should be given freely to the sick to augment one's good fortune. He who gives medicines, diet, food, oil for smearing and shelter to the sick, becomes free from all diseases.

Samvartta.

The giver of medicines, oleaginous remedies and food for the cure of the sick, becomes free from all diseases, happy and long-lived.

Agastya.

Those who give rice and medicines freely attain happiness, being free from disease.

Sāura Purāṇa.

He, who gives medicines to the sick to cure their diseases always remains healthy, long-lived and happy.

¹ अथ आरोग्यदानं ।

तच्चारोग्यदानकालं दुष्यति ।

आह विष्णुमित्रः ।

आरोग्यदानात्परमं न दानं विद्यते कश्चित् ।

अतोदेयं राजार्त्तानामारोग्यं भाग्यवद्भवे ॥

जीवधं पथमाहारं तैलाभ्यङ्गप्रतिषेधः ।

यः प्रयच्छति रोगिभ्यः समवेष्ट्याधिबर्जितः ॥

संवर्त्तः ।

जीवधं खेदमाहारं रोगिणां रोगशान्तये ।

ददामी रोगरहितः सुखी दीर्घायुरेव च ॥

Nandi Purāṇa.

The high-souled man who gives the Brahmins collyrium in charity to cure the diseases of the eye, goes to the Sun (after death) and becomes free from eye diseases, fine-looking and fortunate.

Good health is a step to the acquirement of religious merit, wealth, pleasure and final emancipation, and so the man who bestows cure to the sick and also he who erects a hospital equipped with good medicaments, dresses, learned doctors, servants and rooms for students, always gain them. The doctor should be well-versed in the religious treatises, experienced, familiar with the actions of medicines, a discriminator of the colour of the roots of the herbals and well-acquainted with the

अगस्त्यः ।

अद्वी-पथप्रदातारः सुखं याति विरामवाः ।

सौर पुराणे ।

रोगिणी रोगग्रान्धर्मपथं यः प्रयच्छति ।

रोगहीनः स दीर्घायुः सुखी भवति सर्वदा ॥

नन्दि पुराणे ।

अन्नं यो नरोदद्यादक्षीर्णान्निरुपये ।

विप्राय स पुमान् याति सर्वलोकां महामतिः ।

आरोग्यनयनीं दिव्यः सुभगो जायते नरः ॥

तस्मिन्नेव पुराणे ।

धर्मा-र्थ-काम-मोक्षायां आरोग्यं साधनैर्दुतः ।

अतस्तारोग्यदानेन नरो भवति सर्वदा ॥

आरोग्यप्राप्तां कुरुते महीपथपरिहरी ।

विदग्धवैद्यसंयुक्तां श्रुत्वावस्यसंयुक्तां ॥

proper season of raising them from the ground, well-trained with the qualities of the juices, (their strength and actions), sālī rice, meat and medicaments, trained in compounding medicines, one who knows well of the physique of men by intelligence, one who knows the temperament and the qualities of the diet, a pathologist who is not idle, well acquainted with the remedial agents for the premonitory signs and sequelæ of diseases, proficient in the requirements of time and place, well-read in the medical text-books—the Ayurveda, with its eight divisions and an expert in curing diseases by domestic remedies (prepared from handful of common ingredients).

The pious man who erects such a hospital in which the services of good physicians of this nature are retained, becomes celebrated as the virtuous, the successful and the intelligent

वैद्यस्तु शास्त्रवित् पूज्यो दृष्टौषधपराक्रमः ।
 औषधीर्मूलवर्णनः समुद्धरणकालवित् ॥
 रसवीर्यविपाकज्ञः शालिर्मांसौषधीर्गणैः ।
 योगविद्देहिनां देहं यो धिया प्रविशेत्तुभः ॥
 धातुपथ्यमयज्ञश्च निदानविदतन्द्रितः ।
 व्याधीनां पूर्वलिङ्गज्ञस्तदुत्तरविधानवित् ॥
 देशकालविधानञ्चक्रवित्साशास्त्रवित्तथा ।
 अष्टाङ्गायुर्वेदवेत्ता मुष्टियोगविधानवित् ॥

अष्टावङ्गानि आयुर्वेदस्य ।

यथाशब्दं शास्त्राक्षं कायचिकित्सा भूतविद्या कौमारभ्रत्वमगदतन रसायणतन बाजी-
 करणतनमिति सप्तोक्तानि ।

एवं विष्टः समो वैद्यो भवेद्यथाभिव्योजितः ।
 आरोग्यशालामवन्यं कुर्व्यादौषधैर्मसंययः ॥
 स पुमान् धार्मिको लोके स कृतार्थः स बुद्धिमान् ।
 सम्यगारीर्यशालायामौषधैः सेहपाचनैः ॥

man in this world. If in such a hospital the kind-hearted man can cure a single patient of his maladies by simple medicines, oleaginous remedies and compounds of medicinal decoctions, goes to the Brahma's residence with his seven generations upwards. The rich and the poor acquire religious merit in proportion to the amount of riches they possess; where would the poor man get a hospital and a young physician to cure his diseases? The man secures the eternal regions mentioned before by rendering the sick healthy by the use of roots to some and by good rubbing (with external applications) to others. He who cures the sick suffering from an increase or decrease of the Air, the Bile and the Phlegm by simple remedies, he too goes to such blessed regions (after death) as are secured by those who perform many religious sacrifices (Yajñas).

व्याधिने विरुजौ कृत्य अज्येकं कुरुष्वयुतः ।
 प्रयाति ब्रह्मसदनं कुलसप्तकसंयुतः ॥
 आग्नी विचातुसारेण दरिद्रः फलभान् भवेत् ।
 दरिद्रस्य कुतः शाला आरोग्याय भिषग्द्युता ॥
 अपिमुक्ता किनापि महंनस्यैरद्यापि वा ।
 स्वस्तीकृते भवेन्मर्त्तो पूर्वोक्तं लोकाभ्यर्थम् ॥
 वात-पित्त-कफाद्यानां चया-पचयमेदिनां ।
 यन्तु स्वाध्यायपादेन मोचयेत् व्याधिपीडितान् ॥
 सीपि याति यमान् लोकान् अवाप्यान् यज्ञयाज्ञिभिः ।

स्कन्दपुराणे ।

आरोग्य शाला यः कुर्यात् महावैद्यपुरस्कृता ।
 सर्वोपकरणोपेता तस्य पुण्यफलं येषु ॥
 धर्मा-र्थ-काम-मोक्षाणामारोग्यं साधनं वतः ।
 तस्मादारोग्य दानेन तद्वत् स्यात्तुल्यम् ॥
 अथैकमात्रं विद्यासं स्वस्तीकृत्य प्रयत्नतः ।
 प्राप्नोति सुमहतपुण्यमननं चयवर्जितम् ॥
 ज्ञानयोगेनरतं ज्ञानं रोगार्थं शिवयोगिनः ।
 यः स्वयं कुरुते सीपि सर्वदानफलं लभेत् ॥

Skandapurāṇa.

Hear, the amount of religious merit secured by a man who erects a hospital containing all the necessary articles (of treatment) and in which are engaged eminent physicians by reward. As good health is the means of attaining religious merit, wealth, pleasure and final emancipation, therefore, he by rendering the sick healthy, gives these four blessings.

By carefully curing a learned man of his sickness great merit is secured, which is eternal and indestructible. He too who cures a sickman who is calm and absorbed in meditation of Siva and knowledge, attains the virtue of all kinds of gifts. Brāhmā, Viṣṇu, all the gods, diseases, relatives and kings—they are obstacles to yoga but not to those who perform it (yogi). Whatever merit is obtained by the great, by supporting the sick Brāhman (priests), Kshatriyas (warriors), and Biṭh (cultivators) and Sudras (servants), can not be obtained by the performance of all the great Yajñas (religious ceremonies). As even the gods can not reach the end of the

ब्रह्मा विश्वः सुराः सर्वे व्याधयः स्वजना नृपाः ।

योगस्यैते महाविद्या व्याधयस्ते न योगिनाः ॥

ब्रह्म-क्षत्रिय-विद्-शूद्रान् रोगानान् परिपाल्य च ।

यपुण्यं महादाप्नोति न तर्क्यमङ्गमखैः ॥

आकाशस्य यथा नालः सुरैरप्युपलभ्यते ।

तद्वदारोग्यदानस्य नानावै विद्यते क्वचित् ॥

पुष्टेनानेन महता गत्वा शिवपुरं नरः ।

मीदते विविधैर्भोगैर्विमानैः सर्वकामिकैः ।

एकविंशत्कुलोपेतः सभल्यः परिपालितः ।

आसौ शिवपुरं तावद्यावदाहतसंश्रवं ॥

ततः स्वधर्मश्रेष्ठेण संभ्रातः प्रयतः सदा ।

ज्ञानमुपपादते तस्मा रुद्रेभ्यः परिचारकः ॥

• स्वेन योगिनामिति वा पाठः ।

firmament, so there is no end (to the merit) of the gift of cure. By this great merit, the man reaching the region of Siva enjoys himself by soaring in a balloon which can go to the various desired directions. With his twenty-one generations upwards and surrounded by his servants, he stays in the Siva's realm so long till deluge does not occur. There, after the lapse of his merit, the devoted servant acquires knowledge from Siva.

Abandoning this world by knowledge, abiding by the prayers to Siva, and casting away this body as a straw, he reaches beyond the limits of sorrow. Being freed from all sorrows, becoming pure, all-knowing and self-sufficient, and absorbed in his ownself, they are called the Liberated. Therefore to mitigate the diseases, the sick should be well nursed; the great sages should especially be attended to even by the sacrifice of one's body or riches. The wise must not irritate the weak patients, and they like the preceptors should be rescued constantly from sins. He who relieves the sick, by taking them under his care, reaches the other bank of this ocean of world.

ज्ञानादिरक्तः संसारात्क्विविद्यानमुपायतः ।
 सदिष्टं तेष्वनपक्ता सर्वदुःखान्माप्नुयात् ॥
 समस्तदुःखनिर्मुक्तः दुष्टैः सामान्यबन्धितः ।
 सर्वज्ञः परिपूर्णश्च मुक्त इत्यभिधीयते ॥
 तस्माद्दीपावर्णावै रोगार्त्तं समुपाचरेत् ।
 विशेषेण तु कीनीन्द्रं शरीरेण धनेन च ॥
 रोगिणीं नीदिनेत् प्राप्ती दुःखज्ञानपि सर्वदा ।
 तान् पापाद्बुधश्रित्यनेवमर्थः प्रवर्धते ॥
 यो नृस्यद्द्वैतमात्मानं मन्वसानो दिने दिने ।
 उपसर्पेत रोगार्त्तसौख्यंस्तेन भवार्त्तवः ॥

इत्यारोग्यदानं ।

After these proofs, the statement of Mr. Ameer Ali that "the Arabs invented chemical pharmacy, and were the founders of those institutions which are now called dispensaries"¹ can not be accepted as correct.

DISPENSARIES.

As regards dispensaries, Suśruta advises the physician to construct his dispensary in a clean locality; and the building should face towards some auspicious direction as the east or the north. He says:—"The medicines should be kept in burnt earthen pots arranged on planks supported by stakes or pins".² This is still the method of storing medicines used by the *Kavirājas*. Dallvaṇa explains the passage thus:—"The medicines should be kept in pieces of cloth, earthen pots, wooden pots and Śaṅku (kilaka)."³ The former explanation is plausible for it is impossible to imagine how a kilaka or stake can be a container of medicine, unless it is implied as a point of support for hanging the medicine vials from it.

Dr. Heyne (1814) thus describes the ancient dispensaries of the Hindus: "The place in which medicines are kept should

¹ History of the Saracens p. 262, 1899.

² श्रोतव्यं शालाफलकण्डूविन्यस्तभेषजं
प्रशस्तायां दिशि यच्चौ भेषजागारमिष्यते ॥

Suśruta Saṁhitā. I. xxxvii.

³ शृङ्गीतौषधसंस्थापनीपादं दर्शयन्नाहः,—श्रुतिर्ति । श्रोतः कर्पटखण्डं, सदा भाण्डं, यत्तुभाण्डं । फलकं पटकं इति पुस्तकान्तरे पाठः, ऋदुः कौलकः, एतेषु श्रोतादिषु विन्यस्तं इत्तं भेषजं यच्चिन् शृङ्गे तत् भेषजागारं भेषजशृङ्गमिष्यते इति सम्बन्धः । प्रशस्तायां दिशि पूर्वस्थासुतरस्यां वा, यच्चौ द्वेष्टे यच्चिन् भूमिप्रविभागीयाध्याये, निवन्धेषु व्यत्ययेन न पाठो दृश्यते । अस्माभिस्तु इत्तकमरीत्येव पाठो लिखित इति सर्वोपपन्नसाधोषित्यादि यावन्नरं द्रव्यं पुराचखेति पाठं कैचिदाचार्या न पठन्ति ॥

be clean, dry, and not accessible to rats, white ants or dust. The drugs ought to be put in nets, or large pots, the mouth of which must be tied over with a piece of cloth, and suspended in a room. Fire, smoke and water must be kept at a distance.

The house in which medicines are stored, should be neither in too high nor too low a situation, and it should not be far distant from places in which medicines may be collected. Its front should face either the south or the north, with a convenient *viranda* before the door of the same side.

The necessary apparatus for mortars, scales, &c., must be kept in a place in the wall that has been consecrated for that purpose by religious ceremonies."

After describing the different classes, and members composing each class, of medicines, Suśruta continues: "The wise physician should collect and classify these medicines, and with them prepare external applications, infusions, oils, ghee, syrups, &c., as required for derangement of a particular humour. The medicines should be carefully preserved in all seasons, in rooms free from smoke, rain, wind and dust. The medicines should be used singly, or in combinations of several medicines of a class, or of an entire group, or of more than one group, according to the nature of the disease, and the extent of derangement of the humours."¹

¹ एभिर्लेपान् कषयाश्च तैलं सर्पौषिपानकान् ।
प्रविभज्य वयान्माद्यं कुर्वीत मतिमान् भिषक् ॥
धूमवर्षानिलक्लेदेः सर्वर्तुष्वनभिद्रुते ।
वाहयित्वा मृद्वे न्यसेद्विधिनोपधसंयुतं ॥
समौख्य दीपभेदाश्च गणान् मित्रान् प्रवीजयेत् ।
शुक्लश्याव् संमत्तान् वा गन्धं वा व्यस्तमङ्गलं ॥

ANÆSTHETICS.

In the medical text books of the Hindus, there is no mention of a general anæsthetic, from which we can infer that it was unknown in those ancient days. There are, however, many indications to show that the earlier surgeons felt the necessity of such an agent to produce insensibility to pain. Both Caraka and Suśruta mention the use of wine to produce the desired effect. Caraka says: "After extraction of a dead fetus before the full term of pregnancy, wine should be prescribed to her, for that will improve the condition of her uterus, make her happy and alleviate the pain of the operation."¹ Suśruta, however, distinctly lays down that "wine should be used before operation to produce insensibility to pain." He again remarks: "It is desirable that the patient should be fed before being operated on. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient, who has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation."²

The use of certain drugs to produce anæsthetic effects was well known to the ancient Greeks and Romans. Dioscorides

¹ व्यपगतगर्भश्चान्यु स्त्रियमामगर्भा सुराशौचनरिष्टमधुमदिरासवानामन्वतममये सामधेतः पाययेत् गर्भकोष्ठविग्रहाद्यमर्तिविग्ररथाग्रे प्रद्वर्पन्वायञ्च ॥

Caraka Saṁhitā, IV, viii.

² प्राक्शस्त्रकर्तव्येष्टं भोजयेदातुरं भिषक् ।
मद्यपे पाययेन्मद्यं तीक्ष्णं योऽवेदनासहः ॥
न मूर्च्छत्यग्रसंघीमान्मरुः शस्त्रं न बुध्यते ।
तस्मादवश्यं भोक्तव्यं रोगेष्टुषु कर्तव्येति ॥
प्राचीं दद्यान्मनरीं नृणां वाक्प्राणगुणान्वितः ।
धारयत्यविरोधेन शरीरं पाद्यभीतिकं ॥

Suśruta Saṁhitā, I, xvii,

mentions Mandragora (*Mandragora Atropa*) to have been employed internally as a hypnotic and anæsthetic. Pliny (32-79 A.D.) in his *Natural History* mentions that this anæsthetic was also used by inhalation; and this fact is corroborated by Galen, Aræteus, Celsus and others. The Arabian physicians also used it. The Chinese surgeons still use some powder (Indian hemp probably) to throw their patients into profound sleep. In the 13th century Theodoric (died 1208) described the "spongio somnifera" the vapours raised from which were capable, when inhaled, of setting patients into an anæsthetic sleep, thus inducing insensibility to the agony and torture of a surgeon's knife. Baptista also mentions his "*Pomum somniferum*", to be made with mandragora, opium, &c. The Hindus also inhaled the fumes of burning Indian hemp as an anaesthetic at a period of great antiquity. As early as 927, A. D., they also knew drugs which they employed for the same purpose, for Paṇḍit Vallāla, in his *Bhoja Prabandha*, alludes to a cranial operation performed on the King Bhoja after he was rendered insensible by some drug called *Sammohini* (producer of unconsciousness). Another drug is also mentioned, *Sañjibani* (restorer to life), by which he soon regained consciousness after the operation had been finished.¹

¹ ततश्चावपि राजानं मीढधूयेन मीढयित्वा शिरःकपालमादाय तत्करीटिकागुटे स्थितं शफरकुलं गृहीत्वा कर्षिंश्चिदाजने निक्षिप्य सन्धानकरण्या कपालं यथावद्वारचय्य सञ्जीवनाय च तं जीवयित्वा तस्मै तद्दर्शयताम् ।

CHAPTER III.

MATERIALS OF INSTRUMENTS.

IRON AND STEEL.

In the R̥gveda, *ayas*, (Latin *aes*), next to gold, is the metal most often referred to. *Āyas* often stands as a generic name to mean simply "metal," though in later works it signifies iron as a rule. The mention of dark and red *ayas* in the Atharva-veda indicates a distinction between iron and copper or bronze. The surgical instruments of the Hindus are recommended generally to be made of iron; but Sūśruta allows other suitable material when iron of good quality is not available.¹ He says: "A wise surgeon should get the instruments made of pure iron and with sharp edges by an expert blacksmith who is skilful and experienced in his craft."² The use of impure iron as a material for surgical instruments, he deprecates as a defect and advises the surgeons not to rely on such instruments.

The Hindus were acquainted with steel and they knew how to turn out steel of fine quality from a pure iron ore. Nāgārjuna, the well known Buddhist chemist, wrote a scientific

¹ तानि प्राक्शो जीह्वानि भवन्ति तत्प्रतिरूपकाणि वा तदन्वाभे ।

Sūśruta Saṁhitā. I. vii.

² शस्त्राण्येतानि सतिनान् शुद्धमेकाग्रयमानि तु ।

कारयेन् करणैः प्राप्तं कर्मारं कर्मजीविदं ॥

Ibid, I. viii.

treatise on steel and iron.¹ Śībodāsa in his commentary on Chakrapāṇi quotes Patañjali as an authority on the subject.² In the Dhanurveda, Viracintāmaṇi, Śāraṅgadhara-paddhati and Lohārṇava, steel as a material of sword has been described and classified.

Dr. Mitra quotes some references³ about the knowledge of iron possessed by the ancient Hindus from the Rgveda. He finds that "swords (II. 156), spears (IV. 25), javelins (II. 292), lances (I. 774), (IV. II. 288) and hatchets (I. 120) are frequently mentioned; and these weapons were bright as "gold" or golden (IV. 19), "shining bright" (I. 175), "blazing" (IV. 93), "sharp" (IV. 113) and "made of iron" (I. 226); they are "whetted on a grind stone (II. 36) to improve their keenness (I. 150), and "polished to enhance their brightness" (II. 326)..... "According to Nearchus, King Porus gave 30 lbs of steel to Alexander as the most precious present he could offer."

Royle also remarks⁴: "Working in metals they have long been famous for: their steel acquired so great celebrity at an

¹ नागार्जुनी मुनीन्द्र शशास वल्लीहशास्त्रमतिमहत्तम् ।

तस्मादर्थस्य अतये वचनेतद्विशदाचरैर्भूमः ॥

Cakradatta, Rasāyanādihikāra.

² अर्द्धयिला विधानेन हेरम् भुक्ताम्बरौ ।

लीकपालान् यद्वाथैव क्षेत्रपालान्धीपथम् ।

आदित्यदिवतावेशा धनन्तरी-पतञ्जली

दद्याद्विध सर्वेभ्यो नानामर्चापचारतः ॥

Quoted in Śībodas's commentary on Louhamāra-
Vidhi in Cakradatta.

³ Dr. R. L. Mitra's Indo-Aryans, Vol. 1, P. 301. See Wilson's Rgveda.

⁴ Royle's Antiquity of Hindoo Medicine, Pp. 46-7.

early period, as to have passed into a proverb among the Persians, where *fouladee hind* indicates steel of the best quality; and *juwabee hind*, an Indian answer, means a cat with a sword made of Indian steel."

COPPER.

Pure copper was also used as a material of instruments; and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. A copper probe for applying antimony to the eye has been found in the excavations of Bijnor and another in the Bihat excavations. Cakradatta¹ advises us to use a copper probe for the application of *lekhana* collyrium; and Suśruta mentions a copper needle in the operation for reclamation of cataract.²

TIN.

Tin was also used as a material of blunt instruments. Suśruta mentions plates of tin to surround a tumour and to protect the healthy parts, before the application of actual cautery.³ Such plates are recommended to be made of tin, or lead, or copper, or iron.

LEAD.

Tubes of lead were used for purpose of fumigation. Probes made of lead were used for application of collyrium. The use

¹ प्रशस्ता लिखने तासौ रोपने कालवीहजा ।

Cakradatta, Añjanadhikāra.

² तासायसौ श्रातकौश्री शलाका स्वादनिन्दिता ।

Suśruta Saṁhitā, VI. xvii.

³ अस्त्रावशिष्टे कृत्तिभिः कृते च लिखिततीक्ष्णिं विदधौत पत्रात् ।

यदस्यमूलं तपुतामसीस पटैः समावेद्य तदायसेत्वा ।

चाराग्रिशस्त्राश्च स्रजद्विदध्यात् प्रानासहिंसनं भिषग्प्रमत्तः ॥

Suśruta Saṁhitā, IV. xviii.

of lead plates to surround tumours before application of actual cautery has been noted above.

BELL-METAL.

The use of bell-metal—an amalgam of zinc or tin and copper, 25 parts of the former with 75 parts of the latter,—as a material of probes for applying collyrium, is mentioned by Suśruta.¹

GOLD AND SILVER.

Gold was known to the Hindus from the remote antiquity; and among the metals, it is the one most frequently² mentioned in the R̥gveda. Silver was perhaps unknown during the earlier Vedic age, from its name being not mentioned in the R̥gveda. But no conclusion can safely be drawn from this argument³. We find, however, gold, silver, and other precious

¹ सौवर्णं राजतं शङ्खं लोहं वैदूर्यकाम्बुजं
आयसानि च दीप्यानि शलाकाश्च यथाक्रमं ॥

Suśruta Saṁhita, VI. xviii.

² "निष्कं सौव"

R̥gveda. 5 Mandala. 19 Śukta.

"निष्केन सुवर्णं न अलङ्कृता सौव" ।

Sāyana.

अथः न ईम्बावान् ।

Ibid. 4 Mandala. 2 Śukta.

"सुवर्णं निर्मितं कल्यावान् अथः" ।

Sāyana.

"A horse with golden caparisons"—Wilson.

³ "एनो रयि" ।

R̥gveda. 5 Mandala. 33 Śukta.

एनवर्णो ह्येतवर्णो रयि धनं ।

Sāyana.

"Query, if silver money be intended"—Wilson.

stones mentioned as materials of instruments in the medical books. Gold and silver vessels and plates are often described in Sanskrit literature.¹ Suśruta mentions the use of drinking cups made of gold, silver and precious stones.²

Caraka, amongst other things necessary for a lying-in-room, mentions two needles of gold and silver.³ To cut the navel-cord of the new-born child, he recommends a knife made of gold, or silver, or iron.⁴ In the *Manusmṛhitā*⁵ we find: "Before the section of the navel string, a ceremony is ordained on the birth of a male; he must be made while sacred texts are pronounced, to taste a little honey and clarified butter from a golden spoon."⁶ A golden needle is mentioned by

- ¹ सुवर्णरूप्यशङ्खश्च यज्ञि रज मयानि च ।
कांस्याय स्नाय रैखानि एपुसीस मयानि च ।
निलोपानि विशुद्धानि कैवल्येन जलेन तु ॥

इति ब्राह्मे ।

- ² सौवर्णे राजते तामे कांसि मणिमये तथा
पुष्पावतंसं भीमे वा सुगन्धि सखिलं पिबेत् ॥

Suśruta Saṁhitā, I. xlv.

- ³ * * * तीक्ष्णौ सूक्ष्मौपिच्यवर्णौ सौवर्णराजतौ द्वे शस्त्राणि च तीक्ष्णायसानि ।

Caraka Saṁhitā, IV. viii.

- ⁴ नाभिबन्धनात् प्रभवति हिलाटानुलसमिन्नानं कृत्वा श्लेदनावकाशस्य इथीवन्तरयोः
ग्रनेभ्यं हिला तीक्ष्णेन रौक्मराजतायसानां श्लेदनानामन्वतमेनीर्धारेण श्लेदयेत् ॥

Ibid.

- ⁵ प्राङ् नाभिबर्धनात्पुंसी जातकर्म विधीयते ।
मन्त्रवप्राशनं चास्य हिरण्यमधुसर्पिषाम् ॥

Manusmṛhitā, II. 29.

- ⁶ *Manusmṛhitā* (ch. II. V. 29, Jones's trans.)

Suśruta for pricking the bulb of Soma plant to extract its juice.¹ To cure trichiasis, Cakradatta mentions a needle cautery of gold.² For destroying the hair follicles, he advises us to pass the hot needle into them as soon as the eyelashes are removed by epilation. In the Yogaratnākara, is mentioned a cantery of gold, to burn the fistulous track round the anus.³ Śārāgadharma mentions silver or coral pots for keeping medicated snuffs,⁴ and gold and silver tubs for immersing patients in medicated lotions.⁵

HORN.

Horns of animals are mentioned as suction-apparatus. For

¹ * * * * सीमकन्दं सुवर्णमुच्चादिविदार्य पयोऽग्रहीयात् सीवर्षं पातेऽग्रहिमातं * * * *

Suśruta Saṁhitā, IV. xxix.

² प्रवृत्तान्मुखं रीम सङ्घिषीरुद्धरच्छनैः ।
सन्दंशेनोद्धरेद्दृष्ट्वा पञ्चरोमाणि हुहिमान् ।
रक्षत्राणि दहेत् पक्ष तदङ्गिभग्नलाकया ।
पञ्चरोमे पुनर्नैव कदाचिद्रोमसम्भवः ॥

Cakradatta, Netraroga Cikitsā.

³ अपानमार्गपिटिकां दहेत् स्वर्णशलाकया ।
अग्निप्रतप्तया पश्चात् कुण्डादग्निवज्रक्रियाम् ॥

Yogarātnākara, p. 347.
(Anandāramam Serjes).

⁴ कीचमच्छिद्रधारणं हेमतारादिशुक्तिभिः ।
शुद्धा वा पात्रे युक्त्वा वा ज्ञातेत्या नस्यमाचरेत् ॥

Śārāgadharma Saṁgraha, III. viii.

⁵ सीवर्षं राजतं वापि तावमायसवदारुजं ।
कीटजं तत्र कुलीवीच्छादे षट्षिंशद्दण्डं ॥

Ibid, III. ii.

this purpose, the horn of a cow is recommended.¹ A probe made of horn is advised to be used for applying collyrium. Suśruta mentions goat's horn to be used as a container of medicine.² He also recommends for this purpose vessels manufactured out of horn.³ Similarly Caraka advises us to keep medicines in the lamb's horn.⁴ Tubes of Vasti-yantra (clysters) are often described to be made of horn.⁵

BONE AND IVORY.

Vāgbhāṭa II describes the aṅguli-trāṇaka or finger-guard to be made either of wood or ivory.⁶

¹ "वृषणे", विष पूयाया चूषण निमित्तं शरीरेषु युज्यते यत्, "मङ्ग" गवादि भवे
वृषिर' मङ्ग' * * * *

Vāgbhātārtha Kaumudī, I. xxv.

² चूर्णाञ्जनं कारयित्वा भाजने मेघमङ्गजे ॥

संस्थाप्योभयतः कालमगच्छेत्, सुततं वृषः ।

Suśruta Saṁhitā, VI. xv.

वंशे वा माहिषे मङ्गे स्थापयेत् शोधितं रसम् ।

Rasendra Cintāmaṇi. IX.

³ एतच्चूर्णाञ्जनं येत्र निहितं भाजने शुभे ।

दनास्फटिकवैदूर्यं शङ्खशैलासनोद्वे ।

शातकुम्भेऽथ शाङ्गं वा राजते वा सुसंस्कृते ॥

Suśruta Saṁhitā, VI. xix.

⁴ सिङ्गः शैलासने भाण्डे मेघमङ्गे च संस्थितः ॥

Caraka Saṁhitā, VI. xxvi.

⁵ विमुद्रासं निखण्णाच्च धातुजां काठजां तथा ।

षडङ्गुलीभ्यां गोपुच्छां नाडीं युष्मात् द्विहस्तिकां ॥

Śārṅgadharma Saṁgraha, III. ii.

⁶ अङ्गुलि वाणकं दालं वाचं वा चतुराङ्गुलं ।

Aṣṭāṅga Hṛdaya. I. XXV.

WOOD.

To apply vapour-bath, Śārṅgadhara mentions tubes made of wood or metal.¹ Wooden Tubes for injections were also used.²

STONE.

Śārṅgadhara says: "The collyrium probes should be made either of stone or metal".³ For compounding medicines, stone *khal* or mortar and pestles are mentioned. A big stone slab with a muller is recommended to be used for grinding dry or fresh vegetable medicines. In extracting the Soma juice, two slabs of stone are mentioned in the R̥gveda.⁴

EXECUTION.

The execution of the instruments is said to have been all that can be desired. Suśruta says⁵: "They should be made just of the proper size with their ends rough or polished; they should be also strong, well-shaped and capable of a firm grasp." Again he continues: "When an instrument (has been selected) of

¹ नेत्राणि धातुजान्धातुर्नखं वंशदिजान्दपि ॥

Śārṅgadhara Saṁgraha, III. ix.

² नेत्रं कार्यं सुवर्णादिधातुभिश्चवेष्टभिः ।
नलेदंष्ट्रेदिवाशयैः मणिभिर्यं विधीयते ॥

Ibid, III. v.

³ मुखयोः कुष्ठिता द्रव्या मलाकावाहूलोन्मिता ।
अश्लजा धातुजा वा स्यात् कलायपरिमण्डला ॥

Ibid, III. xiii.

⁴ R̥gveda. 10 Mandala, 76, 94 & 175 Śuktas.

⁵ समाहितानि यन्त्राणि खरद्वन्द्वमुखानि च ।
मुहद्वानि मुरुपाणि मुखकाणि च कारयेत् ॥

Suśruta Saṁhitā, I. vii.

a fine make and with an edge keen enough to divide the hairs on the skin, and when it has been firmly grasped at the proper place, only then it should be used in any surgical operation"¹. And again: "A wise surgeon will get his instruments made of good iron and with sharp edges, by a blacksmith who is skilful and experienced in his craft."² Vāgbhāṭa also gives the same directions.³

ORNAMENTATION.

In the absence of actual specimen, it is impossible to say whether there was any ornamentation on the surgical instruments of the Hindus. No ornamentation is described in the extant medical treatises. Only one instrument—*Mucuti*—is mentioned by Vāgbhāṭa II as being ornamented with a ring.⁴

EDGES OF SHARP INSTRUMENTS.

Suśruta says⁵: "The edges of instruments, used in incising

¹ यदा मुनिश्चितं शस्त्रं रोमच्छेदि सुसंस्थितं ।
सुगृहीतं प्रमाणेन तदा कर्मसु योजयेत् ॥

Ibid, I. viii.

² See foot-note 2, P. 61.

³ षड्विंशतिः सुकर्मारैर्घटितानि यथाविधि ।
शस्त्राणि रोमवाहीनि बाहुव्येनाहुलानि षट् ॥
सुरुपाणि सुधाराणि सुदृढाणि च कारयेत् ।
अकरालानि सुशतमुतीक्षावर्ततेऽयमि ॥
समाहितमुख्याणि दीलाभोजच्छेदीनि च ।
नामानुगतरुपाणि सदा सन्निहितानि च ॥

Aślāṅga Hṛdaya, I. xxv.

⁴ मुचुटी सूत्र दन्तजुर्मले रुचकभूषणा ।

Ibid.

⁵ तत्रधारा भेदनानां मादरी । लेखनानामर्शमादरी ।
व्यधनानां विस्त्रावणानाञ्च कैशिकी । लेदनानामर्शकैशिकीति ॥

Suśruta Saṁhitā, I. viii.

(as of Vṛddhipatra, Nakhaśastra, &c.) should be of the fineness of a masūra (Ervum Lens); of those used in scarifying (as Maṇḍalāgra &c.) of a half a masūra; of those used in puncturing (as Kuṭhārikā) and evacuating (as needles, kuśāpatra, &c.) of a hair; and those used in dividing (as Vṛddhipatra), of half a hair". As to the Vajṛīśa or hook and the Dantaśaṅku or tooth-scalers, the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of barley."¹

THE TEMPERING OF SHARP INSTRUMENTS.

Suśruta remarks² that "the instruments are tempered in three ways,—by immersing the heated śastra in an alkaline solution, or water, or oil. Those tempered in an alkaline solution are used in dividing bones and in excising arrows and other foreign bodies. Those tempered in water are used in incising, dividing or clearing muscles; and those tempered in oil are used in puncturing veins and dividing nerves and tendons."

As the methods of tempering the śastras are the same as those recommended for the arms of war, we quote from Vṛddha Śārṅgadharma (the elder), two methods of tempering arrow-heads and swords. He says³: "I shall describe the ways of tempering arrow-heads, by smearing them with a paste of

¹ बहिर्गो दन्तशङ्खान्तये तीक्ष्णकण्टकप्रथमं यवपत्रमुले ।

Suśruta Saṁhitā, I. viii.

² तेषां पाथना विविधा चारीदकतैलेषु तत्र चारपायितं शरशलाखिच्छेदनेषु ।
उदकपायितम् मांसच्छेदनभेदनपाटनेषु तैलपायितं शिरालघनसाधुच्छेदनेषु ।

³ क्लृप्ता पाथनं बल्ये वनौषधिविलपने ।

Ibid.

युन दुर्भेद्यवर्काणि भेदयेत् तरुपर्णवत् ॥

Vṛddhya Śārṅgadharma.

vegetable drugs, which would thus acquire the power of piercing a coat-of-mail as easily as the leaf of a tree."

I.

"Make a paste of Pippali (Piper Longum), rock-salt and Kuṣṭha (Saussurea Lappa) with cow's urine. These are to be well mixed until the paste becomes cold and yellow. The arrow-heads and other sharp cutting instruments are to be well smeared with that paste and then heated to redness. Then they are to be removed from the furnace and allowed to cool down to a state short of redness and dipped in oil. By this means, the iron acquires special power as a cutting instrument¹".

II.

"Make a paste of the five kinds of salts,² mustard and honey. Let the instrument-maker smear it on the śastras which are then to be heated in a furnace. When the colours resembling those of a peacock's 'feather' are displayed on the śastra, the burning is known to be adequate. The instrument is then dipped in water³".

¹ पिप्पली सैन्धवं कुठं गोमूत्रेण तु पेययेत् ।

अतिशीतं मनाविहं पीतं नष्टं तद्यौषधम् ॥

अनेन लेपयेच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ।

ततो निष्कापितं तैले लोहं तत्र विमिश्रते ॥

Vṛddhya Śārṅgadharma.

² सौषर्षलं सैन्धवञ्च विडमौहिदमेव च ।

सामुद्रेन सङ्केतानि पञ्चमुलंबवन्नि च ॥

Valdyaka.

³ पञ्चभिर्लवणैः पीटं मधुसिक्तः समुपयेः ।

एभिः प्रलेपयेच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ॥

मिश्रिष्योषानुवर्षाभिं तत्तपीतं तद्यौषधं ।

ततश्च विमलं तीक्ष्णं पावयेच्छस्त्रमुत्तमम् ॥

Vṛddhya Śārṅgadharma.

III.

The sage Uṣanās or Śukrācāryya thus describes¹ the tempering of swords in the Vṛhat Saṁhitā (Kern's trans. Ch. L.) :—

23. The fluid to imbrue a sword with, according to the precepts of Uṣanās, is: blood, if one wishes for a splendid fortune; ghee, if one is desirous to have a virtuous son; water, if one is longing for inexhaustible wealth.

24. An approved mixture to imbrue the sword with, in case of one desirous to attain his object by wicked means, is: milk from a mare, a camel and an elephant. A mixture of fish bile, deer-milk, horse-milk, and goat-milk, blended with toddy, will make the sword fit to cut an elephant's trunk.

25. A sword first rubbed with oil, and then imbrued with an unguent compounded of the milky juice of the Calotropis, goat's horn, ink, dung from doves and mice, and afterwards whetted, is fit for piercing stone.

-
- ¹ वङ्गवीर्यकरेणुदुग्धपानं
यदिपानेन समीहतेऽर्षसिद्धिः ।
भयपिच्छमाय वस्तुदुग्धैः
करिहस्तच्छिदये सतालमर्भैः ॥
आकं पयो वृद्धं विषाद्यमसीममेत
पारवतासु शकृता च पुतं प्रलेपः ।
ग्रन्थस्य तैलमयितस्य ततोऽस्य पानं
पश्चाच्छित्तस्य न शिलासु भवेद्विधातः ॥
चारि कदल्या मयितेन पुले
दिनीयिते पायितमायसं यत् ।
सम्यक् शितं चाग्रनि नैति भर्जं
न चान्वलीह्यपि तस्य कौशल्याम् ॥

26. An instrument imbrued with a stale mixture of potash of plantains with butter milk, and properly whetted, will not get crooked on a stone, nor blunted on other iron instruments.

GOOD AND BAD QUALITIES OF SURGICAL INSTRUMENTS.

Suśruta says¹: "The good points in an instrument are the following: it should have a well-made handle, affording a firm grasp; it should be made of iron of good quality; it should have a fine edge, a pleasant shape and a well-finished point; and it should not be dentated (except the saw)." He gives preference to the Śāstras which are of good make and with a fine edge—so fine as to divide the hairs on the skin and whose handles can easily be grasped by the surgeon's hand.

On the other hand, he points out eight defects² of sharp instruments: they must not be bent, or blunt, or broken, or jagged, or too thick, or too thin, or too long, or too short. Instruments free from these defects should be used. The Karapatra or saw is the only exception, for being used for sawing bones, it requires a jagged or dentated edge. Vāgbhaṭa also mentions these defects.³

¹ तानि सुग्रहाणि सुकीडाणि सुधारानि सुरूपाणि सुसमाहितमुखायण्यकराणानि चेति शस्त्रसम्पत् ।

Suśruta Saṁhitā, I. viii.

² तत्र वक्रं कुण्डं खण्डं खरधारमतिस्खूलमलस्यमतिदीर्घमतिदृक्खमित्यष्टौ शस्त्रदोषाः । अतो विपरीतगुणमाददीतान्वय करपञ्चानि खरधारमस्त्रिच्छेदनाथे ।

Ibid.

³ कुण्ड-खण्ड-तनु-स्खूल-दृक्-दीर्घत्व-वक्रताः ।
शस्त्राणां खरधारत्वमष्टौ दोषाः प्रकीर्णिताः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

Suśruta enumerates twelve defects¹ of blunt instruments, viz., it may be too thick, or made of impure metal, or too long, or too short, or incapable of being grasped, or capable of being grasped (unevenly) partially, or bent, or made of too soft material, or of elevated ends, or it may have bent, loose, elevated, and weak pins, or be of weak ends, or of thin sides. These faults refer principally to the *Swastika yantras* or the cruciform instruments.

THE USES OF INSTRUMENTS.

Twenty four different kinds of operations² are said to be performed by the blunt instruments (Suśruta), viz:—

- | | |
|-----------------|---|
| 1. Nirghātana | ... Extraction by moving to and fro. <i>e. g.</i> śalyanirghātana. |
| 2. Pūrāṇa ... | ... Filling the bladder or eyes with oil |
| 3. Bandhana ... | ... Bandaging and binding by rope. |
| 4. Vyūhana ... | ... 1. Raising up and incising a part for removing a thorn or 2. bringing together the lips of the wound. |
| 5. Vartana ... | ... Contracting or curling up. |

¹ तथातिमूलनसारमतिदीर्घमतिउल्लमयादिविषमयादिवज्रं शिथिलमव्युद्यतं स्रदुकीलं स्रदुमुखं स्रदुपाशमिति द्वादश यत्नदीपाः ।

Suśruta Saṁhitā, I. vii.

² यन्त्रकर्मोक्तिं निर्घातनपूरणवन्धनव्यूहनवर्तनचालनविषर्जनविवरणपीडनमार्ज-
विशीघ्रनविकर्षणाक्षरणाघनीकसनविनमनमज्जनोक्थनालुप्यैषदारणजं करणप्रचालनप्रथमन-
प्रमार्जनानि चतुर्विंशतिः ।

- | | | |
|---------------------|-----|---|
| 6. Cālana | ... | 1. transferring, i.e., removing from one part to another; 2. moving a foreign body. |
| 7. Vivartana | ... | Turning round. |
| 8. Vivaraṇa | ... | Exposing or opening out any part. |
| 9. Pīḍana | ... | Pressing as by finger to let out pus from an abscess. |
| 10. Mārga Viśodhana | ... | Clearing the canals such as the urethra, rectum &c. |
| 11. Vikarṣaṇa | ... | 1. Extraction by pulling; or 2. loosening a foreign body fixed in muscles &c. |
| 12. Āharapa | ... | Pulling out. |
| 13. Āñcana | ... | Pulling up. |
| 14. Unnamana | ... | Elevating or setting upright as the depressed cranial bones or ears. |
| 15. Vinamana | ... | Depression as of the elevated ends of the fractured bone. |
| 16. Bhañjana | ... | 1. Rubbing the head, ears &c.; 2. contusing a part all round before it is surgically operated on. |
| 17. Unmathana | ... | Probing or stirring the track formed by an impacted foreign body. |
| 18. Ācuṣaṇa | ... | Suction as of poisoned blood and milk by horns, or gourd, or mouth. |

- | | | |
|----------------|-----|---|
| 19. Eṣaṇa | ... | Exploring as by an earth-worm shaped probe, the direction of a sinus or the existence of a foreign body in the wound. |
| 20. Dāraṇa | ... | Splitting or dividing as the head, ears &c. |
| 21. Rjukaraṇa | ... | Straightening anything which is bent. |
| 22. Prakṣāḷana | ... | Washing as a wound with water. |
| 23. Pradhamana | ... | Blowing as powders into the nose through tubes. |
| 24. Pramārjana | ... | Rubbing out as foreign bodies from the eyes &c. |

Vāgbhaṭa recognises only fifteen different kinds¹ of operations performed by the blunt instruments:— Nirghātana (moving to and fro), Unmathana (probing), Pūraṇa (filling up), Mārga Śuddhi (clearing passages), Saṁvyūhana (raising up and extracting a thorn by incision), Āharaṇa (pulling out), Bandhana (bandaging), Piḍana (pressing), Ācūṣaṇa (suction), Unnamana (elevation), Nāmana (depression), Cāla (movement), Bhaṅga (breaking), Vyāvartana (turning round); and Rjukaraṇa (straightening).

¹ निघातनोन्मथन पूरण मार्गशुद्धि
संयुहनाद्धरण बन्धन पीडनानि ।
आचूषणोन्नमन नामन चाल भङ्ग
व्यावर्तनरूकनानि च यत्नकथं ॥

The śāstras or cutting instruments, on the other hand, are said to perform eight kinds of surgical operations (Suśruta).¹

1. Chedana Excision or removal of a part of the body by operation as of piles.

Instruments:—Vṛddhipatra, nakhaśāstra, mudrikā, utpalapatra, and arddhadhāra.

2. Bhedana Incision of a part, as of an abscess.

Instruments:—The same as above.

3. Lekhana Scarification or dissection of a skin-flap; or scraping, as of Rohini *i.e.*, surgical diseases of the throat.

Instruments:—Maṇḍalāgra and karapatra.

4. Vedana or Vyādhana ... Puncturing as of veins to bleed patients by instruments having fine points.

Instruments:—Kūṭhārikā, vr̥himukha, āṛā, vetaspatra, and sūci.

5. Eṣaṇa Probing, as of sinus and fistula by a probe.

Instruments:—Eṣaṇī.

6. Āharaṇa Extraction, as of stone by the spoon or hook.

Instruments:—Vaḍḍiśa, and danta-śaṅku.

¹ तत्र शास्त्रकर्मादविधं । तद्यथा । इत्य' मेयं लेखं विध्यमेवमाहायं' विद्याय' सीत्यनिति ।

7. Viśrāvāṇa ... To let out pus as from a deep-seated abscess.

Instruments:—Sūci, kuśāpatra, ātimukha, śarārimukha, antarmukha, trikurccaka, and eṣaṇi.

8. Sīvana Stitching, as of the lips of a wound by needles.

Instruments:—The different kinds of sūci or needles.

Caraka mentions, however, six kinds¹ of operations:—

1. Pātana ... Incision, as in operation for sinus, abscess, intestinal injury, and deeply impacted foreign bodies.
2. Vyādhana ... Tapping or piercing, as in operations for ascites, suppurating tumour, ovarion tumour, boils &c.

¹ पाटनं व्यधनञ्चैव च्छेदनं लेपनं तथा ।
 ग्रीष्मं सीवनञ्चैव यद्विधं ब्रह्मकर्म तत् ॥
 नाडीव्रणाः पक्ष्मीयास्तथा चतुर्दोदरम् ।
 ज्वरः श्लेष्मा ये देशाः पाष्वास्ते तद्विधाश्च ये ॥
 दक्षीदराणि संपक्वा गुल्माः ये ये च रक्तजाः ।
 व्यध्याः शोणितरीमाश्च वीर्यपिडकादयः ॥
 उद्वहन्तान् स्थूलपर्यन्तानुत्सन्नान् कठिनान् ब्रूयान् ।
 कर्मः श्रमत्वधौमांसं छेदनेनोपपादयेत् ॥
 क्लिप्तासानि मुकुहानि लिखेन्नेष्ट्यानि बुद्धिमान् ॥
 वातासृग्दन्तिपिडकाः सक्तीडा रक्तमण्डलाः ।
 कुहान्निहितघातं शोथं च प्रक्षयेद्विषक् ॥
 मीर्यं कुक्ष्यादराधनु गन्धौरं यद्विपाटितं ।
 इति यद्विधमुद्दिष्टं ब्रह्मकर्म मनोविभिः ॥

- | | | |
|------------------|-----|---|
| 3. Chedana ... | ... | Excision, as in the operation for tumours, raised and thickened <i>vraṇa</i> or corns, and piles. |
| 4. Lekhana ... | ... | Scraping, as in operation for some varieties of skin diseases. |
| 5. Pracchana ... | ... | Scarifying, as in the operations for glands, boils, leprous nodules, inflammatory swellings, &c. |
| 6. Sībana ... | ... | Sewing, as in the operation of laparotomy for deep seated diseases in the abdomen. |

Vāgbhaṭa describes thirteen kinds¹ of operations performed by the sharp instruments :—

- | | | | |
|--------------|---|-----|--|
| 1. Utpātana | . | ... | Raising up by incision, as by the Nakhaśāstra. |
| 2. Pātana | | ... | Incision as by the Vṛddhipatra. |
| 3. Sivana | | ... | Stitching as by the Sūci. |
| 4. Eṣaṇa | | ... | Probing as by the Eṣaṇi. |
| 5. Lekhana | | ... | Scraping as by the Maṇḍalāgra. |
| 6. Pracchana | | ... | Scarification as by the Maṇḍalāgra. |
| 7. Kuṭṭana | | ... | Pricking as by the Sūci in tattooing. |
| 8. Chedana | | ... | Excision as by the Vṛddhipatra. |

¹ उत्पाद्य पाद्य सौख्य-लेख-प्रच्छन्न कुट्टनम् ।

द्विधं भेदं व्यधी मन्यो यद्वा दाहय तत्क्रियाः ॥

Aṣṭāṅga Hṛdaya, I. xvi.

9. Bhedana	...	Piercing as by the Sharp Eṣaṇi.
10. Vyadhana	...	Tapping as by the Vetasapatra.
11. Manthana	...	Churning as by the Khaja.
12. Grahana	...	Fixing as by the Sandamśa.
13. Dahana	...	Burning as by the rods.

WHETSTONE.

In the R̥gveda we find the use of stones mentioned for whetting the edges of the arms of war.¹ The Hindu surgeons used a stone slab for sharpening the śāstras or edged instruments.² It was of the colour of māṣa (Phaseolus Roxb.). The whetstones used by the Greeks and Romans were either the marble ointment slabs, or made of clay slate or sandy schistaceous shale.

INSTRUMENT CASES.

To preserve the edges of the cutting instruments, a case made of the wood of śalmāli (Bombax Malabaricum) was used (Suśruta).³ Such cases were also manufactured of canvas, or wool, or silk, or leather. These cases—twelve *aṅguli* (i.e. fingers' breadth) long and nine *aṅguli* broad—were well sewn and

¹ See R̥gveda, Mandala. 2	Sūkta. 39	Verse 7.
„ 9	„ 90	„ 1.
„ 9	„ 112	„ 2.
„ 10	„ 53	„ 9.
„ 19	„ 101	„ 2.

² तेषां निशानायै कृच्छ्रशिला मापयन्ती ।

Suśruta Saṁhitā, I. viii.

³ धारसेव्यापनायै शाल्मली फलकमिति ।

consisted of compartments, lined with wool and separated by partitions for each instrument. They could be folded, closed with a rod and firmly tied by a knot.¹ The barbers of India still use similar cases for their instruments.

That the razor used to be kept in a case, we know from a passage in the *Vṛhadāranyaka* (800 to 500 B. C.) where the author says "It (the Atman) is here all-pervading down to the tips of the nail. One does not see it any more than a razor hidden in its case or fire in its receptacle".²

- ¹ स्वाद्वबाहुलि विस्तारः सुघनी दादशाहुलः ।
 चीमं पहीर्यं कौषेय दुकूलं सदु चक्रेणः ॥
 विन्वस्त पाशः सुस्यूतः सान् रीर्णास्त्रं शस्त्रकः ।
 शलाका पिहितस्य च शस्त्रकौषः सुसचयः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

अथ शस्त्राणां सुरचनार्थं. शस्त्रकौषं माह स्यादित्यादि । नवाहुलिविस्तारः नवाहुल परिमाणविस्तारविशिष्टः शस्त्रकौषः स्यात् । शस्त्रस्य कौषः शस्त्रकौषः । कौषं चाप् इति लोके । यथा अस्त्रिकौष इत्यादि । तथा सुहु, घनी, निविडः सुघनः तथा दादशाहुलः दैर्घ्येण दादशाहुल परिमाणः, तथा चीमादिजः । तथा विन्वस्तः यथा क्रमेण कृतः पाशो यस्य स विन्वस्तपाशः । तथा सुहु, सूतः कृतं सेवनः, सुस्यूतः तथा सान्तराणि सज्जवधानानि, ऊर्णास्थानि मेधादिलीममध्येस्थितानि, शस्त्रानि यस्मिन् स सान्तरौर्णास्त्रशस्त्रकः । तथा शलाकायाः पिहितं स्थागतं आस्थं मुखं यस्य स शलाकापिहितस्य तथा सुहु सचयी, नापित भास्त्रिकचद्राणीकरणं यस्य स सुसचयः । चीमं चतस्रीमृतमववस्त्रं केनैवित् स्यात् । दुकूलशब्दः पहादिभिः श्लिभिः सम्बध्यते । तेन पटदुकूलं पाट् इति स्थातेन सूत्रेण निर्मितं वस्त्रं ऊर्णा, मेधादिलीम तद्वत् वस्त्रं चीर्यं दुकूलं वनात् इत्याख्य वस्त्रादि । कौषेयदुकूलं कौषकार- कौटभव सूत्रेण रेश्म इति स्थातेन निर्मितं वस्त्रं ।

Vāgbhaṭārtha Kaumudī.

² *Vṛhadāranyaka*, I. iv.

Macdonell's *Sanskrit Literature*, p. 22.

To prove that portable cases for medicaments and instruments were in use in ancient India, we quote *in toto* from the *Mohāvāgga* some references to them.¹

BOXES FOR OINTMENTS, OINTMENT POTS, AND PORTABLE CASES.

Now at that time, the Bhikkhus used to put pulverised ointments into pots and saucers. They became sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a box for ointment".

Now at that time the *Khabbaggiya* Bhikkhus used to carry about various kinds of boxes for ointments—gold ones and silver ones. People were annoyed, murmured and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of boxes for ointments, gold ones, and silver ones, are not, O Bhikkhus, to be used. Whosoever does so, is guilty of a *dukkata* offence. I allow, O Bhikkhus, the use of such boxes made of bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of bronze, or of the centre of the chank-shell (*Sankhu-navi*)."

2. Now at that time the boxes of ointment had no lid. (The ointment) was sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

¹ *Mohāvāgga* vi. 12. (Sacred Books of the East).

"I allow you, O Bhikkhus, the use of a lid."

The lid used to fall off.

"I allow, O Bhikkhus, to fasten the lid with thread and tie it on to the box."

The boxes used to fall.

"I allow you, O Bhikkhus, to sew the boxes on with thread".

3. Now at that time the Bhikkhus used to rub ointment on with their fingers, and the eyes were hurt.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a stick or holder to put the ointment on with".

Now at that time the *Khabbaggiya* Bhikkhus used to keep various kinds of ointment-sticks—gold ones, and silver ones. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world".

They told this thing to the Blessed One.

"Various kinds of ointment-holders, O Bhikkhus, are not to be used. Whosoever does so, is guilty of a *dukkata* offence. I allow, O Bhikkhus, the use of ointment-holders of bone, or of ivory, or of horn, or of the *nāla* reed, or of bambu, or of wood, or of lac, or of fruit, or of bronze, or of the chank-shell."

4. Now at that time the ointment-sticks used to fall on the ground and become rough.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a case for the ointment-sticks".

Now at that time the Bhikkhus used to carry the ointment-boxes and ointment-sticks about in their hands.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a bag to put the ointment-box in."

They had no shoulder strap.

"I allow you, O Bhikkhus, the use of a shoulder strap (by which to carry the ointment-box), or of a thread (by which to sew or tie it on)."

13.

1. Now at that time the venerable *Pilindavakkha* had head-ache.

"I allow, O Bhikkhus, the use of a little oil on the head".

(The disease) became no better.

"I allow, O Bhikkhus, the practice of taking up (medicine) through the nose". (See commentary on the *Dhammapada*, pp. 83.)

The nose ran.

"I allow, O Bhikkhus, the use of a nose-spoon" (*Natthukarani*).

Now at that time the *Khabbaggiya* Bhikkhus had various kinds of nose-spoons—made of gold, and of silver. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of nose-spoons, O Bhikkhus, are not to be used. Whosoever does so, is guilty of dukkaṭa offence. I allow, O Bhikkhus, the use of such nose-spoons made of bone, (&c., as in chap. 12, 1, down to :) the chank-shell.

2. The nose took up the medicament in unequal proportions.

"I allow, O Bhikkhus, the use of a double nose-spoon (yamaka-natthu-karaṇī)."

They used to spread the drugs on a wick before they sniffed up the aroma: and their throats got burnt.

'I allow, O Bhikkhus, the use of a pipe to conduct the aroma.'

Now at that time the Kḷabbaggiya Bhikkhus had various kinds of pipes (&c., as in the last clauses of § 1, down to the end).

Now at that time the aroma-pipes came open: and worms got in.

'I allow, O Bhikkhus, the use of a lid to the pipes.'

Now at that time the Bhikkhus carried the pipes about in their hands.

'I allow, O Bhikkhus, the use of a bag to carry the aroma-pipes in'.

The aroma-pipes rubbed against one another.

'I allow, O Bhikkhus, the use of a double bag.'

They had no shoulder strap.

'I allow, O Bhikkhus, the use of a shoulder strap (by which to carry the double bag), or of a thread (by which to sew it on).

OPERATION TABLE.

In the examination for piles, Suśruta directs the patient to lie down on his bed or on a board¹; and in describing the operation, Vāgbhaṭa II mentions a board to be used as an operation-table.² A similar bed, as long as the distance from the top of the head to the knees of the patient, is also mentioned in the description of the lithotomy operation.³ The use of a board as a fracture bed is also advised.

For passing the tubes of the *vasti-yantra* or clysters into the urethra in the male, the patient is recommended to sit on a stool as high as his knees (*jānumātrāsana*).⁴

In phlebotomy, the patient is advised to sit on a stool, an aratni high⁵ (i.e. the distance between the tip of the olecranon process of the ulna to the tip of the little finger).

¹ भूतबलमुपवेश्य सन्धुते सुचौ द्विमे साधारणे व्यथे काले स्मि फलके शय्यायां वा प्रत्यादित्य-
शुद्धमन्वस्रोत्सङ्गे निषण्णपूर्वकायमुत्तानं * * *

Suśruta Saṁhitā, IV. vi.

² यच्चिं कृतस्तत्त्वनं भूतविष्णुवमन्त्रयम् ।

शयने फलके वाचनरीक्षङ्गे व्यापयितम् ॥

Aṣṭāṅga Hṛdaya, VI. viii.

³ ततो बलवन्महिक्रवमाजानुसमे फलके प्रागुपवेश्य पुरुषश्च तस्योत्सङ्गे निषण्णपूर्वकाय-
मुत्तानमुन्नतकटीकं ।

Suśruta Saṁhitā, IV. vii.

⁴ खातस्य भूतभक्तस्य रसेन पयसापि वा ।

सहविष्णुवैद्यस्य पीठे जानुसमे सदौ ॥

Caraka Saṁhitā, VIII. ix.

⁵ तच्च व्यथसिरं पुरुषं प्रत्यादित्यमुखमरत्रिमावीक्षिते उपवेश्यासने ।

Suśruta Saṁhitā, III. viii.

अग्नितापातपखिन्नो जानूचासनमंस्थितः ।

सदुपशान्तकेशानो जानुस्थापितकर्पूरः ॥

Aṣṭāṅga Hṛdaya, I. xxvii.

KAPĀTA-ŚAYANA OR FRACTURE-BED.

In the treatment of fractures of the lower extremities, mention is made of the *kapāta-śayana* (lit. door-bed) or fracture-bed, consisting of a plank of wood resembling the panel of a door.¹ The patient is to lie down on it. The board has five rods fixed to it, to which the fractured limb is tied to prevent any movement: two on each side of the joint and one on the plantar surface of the foot. Dallapa explains it thus²: In fractures of the bones of the leg, two rods are fixed on each side of the ankle and one supports the foot; in fracture of the thigh bone, two rods are fixed on each side of the knee or hip, and one under the foot. In a double fracture of the thigh bone and bones of the

¹ अथ जङ्घीरुभग्नानां कपाटशयनं कृतं ।

कीलका बन्धनावच्छ पञ्च कार्य्या विज्जता ।

यथा न चलनं तस्य भग्नस्य क्रियते तथा ।

सन्धेरुभयतो द्वौ द्वौ, तले चैक्य कीलकः ।

श्रीवृक्षां वा वृष्टवर्षे वा बन्धस्त्यक्तयोक्तया ।

भग्नसन्धिविनीचेषु विधिमेन' समाचरेत् ॥

Suśruta Saṁhitā, IV, iii.

² जङ्घीरुभग्नोऽपि पश्चात् कर्मविशेषं निर्दिष्टग्राह । अथ जङ्घीत्यादि । जङ्घीरुभग्न-
चिकित्सितग्राह । भग्नानाम् काष्ठभग्नानाम् । विविधानामपीत्यपरि । कपाटशयनमवश्यं
कार्यम् । चलनम् कपाट शयनेनैव सह दिशान्तरनयनार्थम् । आधारभूतशयनचालनार्थ-
मित्यन्ते । अधियमूतशरीरावयवचालन परिहारार्थं कीलाः । कीलानां पञ्चसंख्यात्म् ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।
जङ्घीरुभग्नोऽपि तद्वत् भग्नमवैत्य तत्र जङ्घीरुभग्नो तु गुल्फसन्धेरुभयतो द्वौ एकत्र तले एवं पञ्च ।

Dallapa's Commentary, IV, iii.

leg, seven rods are required,—two on the outer side of the ankle, knee, and groin, respectively, and one under the foot. The fracture-bed is recommended to be similarly availed of in fractures and dislocations of the loin, the spinal column, the chest, and the clavicle. And this mode of treatment, he adds, may advantageously be used for the other kinds of fractures and dislocations. Vāgbhaṭa II also mentions it in the treatment of fractures¹.

Hippocrates used a similar fracture-bed for the proper treatment of fractures and dislocations. It was called *Scammum Hippocraticum* or bench of Hippocrates. As the figures of this bench would elucidate the structure of the *kapāta-sayana*, we reproduce here three plates with their explanations given at the end of Vol. II, *Genuine Works of Hippocrates* (Syed. Soc. Ed.), and two plates—*Scammum Hippocratis* and *Plinthium Nileii* from the *Collection De chirurgiens Grecs*.

Fig. 1. The *Scammum Hippocratis* or Bench of Hippocrates, as represented by Andreas a Cruce (*Officina chirrugica venetiis*, 1596).

Fig. 2. The same as represented by M. Littré.

A. A board, 6 cubits long, 2 broad and 12 inches thick; not 13 as incorrectly stated by M. Littré.

B. The feet of the Axles, which are short.

¹ कटी जङ्घोरुमघानां कपाटशयनं हितम् ।
यन्मण्डपं तथा कीलाः पञ्च कार्ये विवन्मनाः ॥
जङ्घोर्वाः पार्श्वयोर्वा ही तल एकव कोष्कः ।
योष्ठां वा पृष्ठवंशे वा वज्रसाचकयोस्तथा ॥

CC. Axle-trees.

DD. Grooves 3 inches deep, 3 broad, separated from one another by 4 inches.

E. A small post or pillar, fastened in the middle of the machine in a quadrangular hole.

F. Pillars a foot long.

G. A cross-beam laid on the pillars FF, which can be placed at different heights by means of holes in the pillars.

Fig. 3. Representation of the mode of reducing dislocation of the thigh outwards, as given by M. Littré (*Couv. d'Hipp.*, tom. iv, p. 305).

A mistake in the figure given by M. Littré is here corrected.

A. A lever applied to the nates of the luxated side, and acting from without inwards, in order to bring the head of the bone into its cavity.

B. Another lever, held by an assistant, put into one of the grooves of the machine, and intended to act against lever A.

C. Groove in which the end of the lever A takes its point of support.

D. The luxated member.

EE. Extension and counter-extension.

Fig. 4. Banc d'Hippocrate, d'après Rufus, servant à réduire différentes luxations. (*Collection De Chirurgiens Grecs, Bibliothèque Nationale*).

Fig. 5. Plinthium, ou cadre de Nileus, d'après Héliodore. (*Ibid*).

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS.

The armamentarium of the Hindu surgeons consisted of a good number of surgical instruments. They are described to be of two kinds, the *yantras* and the *śastras*, i.e., the blunt and the sharp instruments. Suśruta enumerates no less than one hundred and one varieties of the blunt instruments, and twenty different kinds of sharp instruments. Hārīta, on the other hand, enumerates twelve blunt instruments, twelve sharp instruments, and four *prabandhas*, as necessary for the operation of extraction of arrows and other foreign bodies.¹ Vāgbhaṭa II mentions one hundred and fifteen kinds of blunt and twenty-six kinds of sharp instruments. Pālakapya (Treatment of Elephants) mentions ten kinds of *śastras* or sharp instruments though he describes the uses of other instruments required for the surgical treatment of diseases.

INSTRUMENTS AND THEIR CLASSIFICATION (SUŚRUTA.)

Of the one hundred and one varieties of the blunt instruments, the surgeon's hand is rightly considered as the principal instrument, for without its help, no instrument can properly be used, and every surgical operation is under its control.² They are recommended to be used for the extraction

¹ दादशेव तु यन्त्राणि शस्त्राणि दादशेव तु ।

चत्वारि च प्रवन्धानां शस्त्रोद्धारं विनिर्दिशेत् ॥

² यन्त्रशतमेकीतरमत्र हस्तमेव प्रधानतमं यन्त्राणामवगच्छ । किं कारणं । यन्त्राद्वन्त्रादन्ते यन्त्राणामप्रवृत्तिरेव तदधीनत्वाद्यन्त्रकर्मणः ।

तत्र मनःशरीराबाधकराणि शस्त्राणि तेषामाहरणीयायै यन्त्राणि ।

of *śalya* or foreign bodies, *e.g.*, a dart, an arrow, a javelin, a spear, a peg, a pin, a bamboo rod, a stake &c. which cause pain to the body and mind.

A. *Suśruta* subdivides the blunt instruments into six classes,¹ viz:

I. Svastika or cruciform instruments	... 24 kinds.
II. Sandaṁśa or pincher-like	... 2 "
III. Tāla or picklock-like	... 2 "
IV. Nāḍī or tubular or hollow	... 20 "
V. Śalākā or rod or pricker-like	... 28 "
VI. Upayantra or accessory	... 25 "

101

These instruments are advised to be made generally of iron, or of other suitable materials, when iron is not available. Their ends often resemble the faces of some ferocious beasts, or of deers, or birds. Hence the instruments should be so constructed as to have the likeness of their faces, following at the same time the directions of scientific treatises, or the instructions of teachers, or in imitation of other instruments, or in adaptation to the exigencies of the time. They should be of reasonable

¹ तानि षट्प्रकाराणि । तद्यथा । स्वस्तिकयन्त्राणि । सन्दंशयन्त्राणि । तालयन्त्राणि । नाडीयन्त्राणि । शलाकायन्त्राणि । उपयन्त्राणि चेति । तत्र चतुर्विंशति स्वस्तिकयन्त्राणि । द्वे सन्दंशयन्त्रे । द्वे एव तालयन्त्रे । दिशतिर्नायः । षट्त्रिंशतिः शलाकाः । पञ्चविंशति उपयन्त्राणि ।

Suśruta Saṁhitā, I. vii.

Hessler translates the terms as follows: *Uncinata instrumenta*, *forcipum instrumenta*, *palmiformia instrumenta*, *hamata instrumenta*, *secundaria instrumenta*.

Hessler's *Suśruta*, I. vii.

size, with their ends rough or smooth as required. They should be of strong make, good shape and capable of a firm grasp.¹

I. The Svastika or Cruciform instruments are—

1. *Siṃhamukha*. 2. *Vyāghramukha*. 3. *Vṛkamukha*.
4. *Tarakṣumukha*. 5. *Ṭkṣamukha*. 6. *Dvīpimukha*.
7. *Mārjāramukha*. 8. *Śṛgālamukha*. 9. *Airvīrūkamukha*.
10. *Kūkamukha*. 11. *Kaṅkamukha*. 12. *Kuraramukha*.
13. *Cāsamukha*. 14. *Bhūsamukha*. 15. *Śaśaghātīmukha*.
16. *Ulūkamukha*. 17. *Cillimukha*. 18. *Gṛdhramukha*.
19. *Śyenamukha*. 20. *Krauñcamukha*. 21. *Bhṛōgarājamukha*.
22. *Añjalikarṇamukha*. 23. *Avabhañjanamukha*, and
24. *Nandimukhamukha*.

II. The *Sandamśa* or pincher-like instruments are—

1. Forceps with arms.
2. Forceps without arms.

¹ तानि प्रायशी लौहानि भवन्ति तत्प्रतिरूपकाणि वा तद्वत्तामे । तत्र नानाप्रकाराणां व्यालानां खगपक्षिणां मुखेमुखानि यन्त्राणां प्रायशः सुदृशानि तस्मात्तत्सादृश्यादानमादुप-
देशादन्यन्मदर्शनादुक्तितय कारयेत् ।

समाहितानि यन्त्राणि खरश्छमुखानि च ।

सुदृशानि सुरुपाणि सुदृशानि च कारयेत् ॥

Saśruta Saṁhita, I. vii.

अनेकरूपकार्येण यन्त्राणि विविधान्तः ।

विकल्पा कल्पयेद् बुद्ध्या यथाशूलन्तु वक्त्यते ॥

* * * * *

अलौहान्युद्गृह्णाणि तान्येवञ्च विकल्पयेत् ।

अपराख्यापि यन्त्रादीन्यपयोगञ्च यौगिकम् ॥

Aṣṭāṅga Hṛdaya, I. xxv.

III. The Tāla or picklock-like instruments are—

1. Ekatāla.

2. Dwitāla.

IV. The Nāḍī or tubular instruments are—

For fistula-in-ano ... (1) with one slit; (2) with 2 slits ... 2

For piles ... (1) with one slit; (2) with 2 slits ... 2

For wounds 1

For clysters (Rectal) ... (Some authors describe 3 only) ... 4

For clysters (vaginal and urethral)... (male and female) ... 3

For Hydrocele 1

For Ascites 1

For fumigation and inhalation 3

For Urethral Stricture 1

For Rectal " 1

For Cupping—gourd 1

—
20

V. The Śalākā or rod-shaped instruments are—

Gaṇḍīpadamukha or earth-worm like 2

Śarapuṅkhamukha or arrow-stem like 2

Sarpapaṇamukha or snake's hood like 2

Vadīsamukha or fish-hook like 2

Masūradalamukha or masūra pulse like 2

Promāṛjana or swabs 6

Khallamukha or spoons 3

Jāmvavavadana or jambul seed like 3

Aṅkuśavadana or goad like 3

Kolāsthīdālamukha or plum seed like 1

Mukulāgra or bud shaped 1

Mālatīpuspavṛntāgra or like the stem of mālatī flower ... 1

—
28

VI. The Upayantra or accessory instruments are—

1. Rajju—thread. 2. Venikā—twine. 3. Paṭṭa—bandages.
4. Carma—leather. 5. Valkala—bark of trees. 6. Latā—creepers.
7. Vastra—cloth. 8. Aṣṭhilāśma—stone or pebble.
9. Mudgara—hammer. 10. Pāṇipādātala—palm of the hand and sole of the foot.
11. Aṅguli—finger. 12. Jihvā—tongue.
13. Danta—tooth. 14. Nakha—nail. 15. Mukha—mouth.
16. Vāla—hair. 17. Aśvakaṭaka—the ring of a horse's bridle.
18. Śākhā—branch of a tree. 19. Sṭhivana—spittle.
20. Pravāhaṇa—fluxing the patient. 21. Harṣa—objects exciting happiness.
22. Ayaskānta—a loadstone. 23. Kṣāra—caustic.
24. Agni—fire. 25. Bheṣaja—medicines.

B. The sharp instruments or śastras are—

1. Maṇḍalāgra or round headed knife.
2. Karāpatra or saw (*lit.* like the human hand).
3. Vṛddhipatra (*lit.* like the leaf of vṛddhi—an unknown medicinal plant)—a razor.
4. Nakha-śastra or nail-parer.
5. Mudrikā or finger-knife (like the last phalanx of the index finger).
6. Utpalapatra, a knife, *i.e.*, resembling the petal of a blue lotus, (*Nymphaea stellata*, Willd).
7. Arddhaḍhāra or a single-edged knife.
8. Sūci—needles.
9. Kuśapatra—a knife shaped like the kuśa grass (*Eragostis Cynosuroides*).

10. Ātīmukha—a knife shaped like the beak of the Āti bird (Turdus Ginginianus).
11. Śararī-mukha—a pair of scissors like the beaks of Śararī bird.
12. Antarmukha (*lit.* having internal sharp edge)—a kind of scissors.
13. Trikurecaka—an instrument consisting of three needles.
14. Kuṭhārikā—a small axe shaped instrument.
15. Vrihimukha—a trocar shaped like a grain of rice.
16. Arā or awl.
17. Vetasa-patraka—an instrument shaped like the leaf of a rattan (Calamus Rotang).
18. Vaḍiśa—an instrument shaped like the fish-hook.
19. Dantaśaṅku or tooth-pick.
20. Eṣani or sharp probe-like instrument.

According to Hārīta¹ the twelve blunt instruments are—

1. Godhāmukha or iguana-faced. 2. Vajramukha—grdhra-mukha? 3. Tribaktra or three faced. 4. Sandaṁśa or pincher.

¹ गोधामुखं वज्रमुखं त्रिवक्त्रं नाम सन्दमशक्राकृतिकद्वयपादम् ।

अथानकं ग्रहककुण्डलघ्नं श्रीवत्ससौवत्सिकं पञ्चवक्त्रम् ।

हादशैतानि शस्त्राणि कथितानि भिषग्वरैः ।

अथ शस्त्राणि प्रोक्तानि नामानि च पृथक् पृथक् ।

अहं चन्द्रं त्रीहिमुखम् कदपयं कुठारिका ।

करवीरकपचञ्च शलाककरपतकम् ।

वडिशं रथपादञ्च शूलं च सुचिसुद्गरम् ।

शस्त्राण्येतानि प्रोक्तानि शस्त्रीद्वारैः पृथक् पृथक् ॥

5. Cakrākṛti or circular shaped. 6. Anaka ? 7. Kaṅkapāda ?
 8. Śṛṅga or horn. 9. Kundala ? 10. Śribatsa ? 11. Saubatsika ?
 12. Pañcabaktram, i.e., five faced—siṃhamukham ?

The twelve sharp instruments of Hārīta are—

1. Arddhacandra or half-moon shaped. 2. Vṛhimukha.
 3. Kaṅkapatra. 4. Kuṭhārikā. 5. Karavīrakapatraka. 6. Śalākā
 or sharp probe. 7. Karapatraka or saw. 8. Vaḍiśa or sharp
 hook. 9. Gṛdhrapāda ? 10. Śūlī 11. Sūci or needle. 12. Mud-
 gara or hammer ?

Vāgbhaṭa II classifies the instruments in the following way :—

A. Blunt instruments—

I. Svastika, as heron, lion, bear, crow, deer

forceps &c. ... 24

II. Sandaṁśa : It consists of two iron
 blades soldered at one end, the other
 ends being free 2

(a) for extraction of eyelashes &c. ... 1

(b) mucuṭī ... 1

III. Tāla ... 2

(a) Ekatāla ... 1

(b) Dvītāla ... 1

IV. Nāḍī or tubular : ... 23

(a) Kaṇṭhaśalyāvalokini or throat speculum
 having three and five holes ... 2

(b) Śalyanirghātani ... 1

(c) For piles, different sizes for male and
 female ... 6

For inspection : 2 holes—rectal speculum 2

For medication : 1 hole ... 2

For applying pressure : entire—śāmi ... 2

(d) For fistula-in-ano: with one and two holes	2
(e) For nasal polypus &c.	1
(f) Aṅguli-trāṇaka or finger-guard ...	1
(g) Joni-vraṇekṣaṇa or vaginal speculum ...	1
(h) Vrāṇo vasti or wound syringe ...	1
(i) For dakodara or Paracentesis abdominis	1
(j) Vastiyantra or clysters: rectal, vaginal and urethral	3
(k) For fumigation... ..	1
(l) Cupping instruments: Alābu, Ghaṭīyantra and Horns	3
	—
	23

V. Śalākā or rod-like instruments ... 34

(a) Gaṇḍūpadamukha or earth-worm shaped	2
(b) Masūradalabaktra	2
(c) Śaṅku	9
Faṇībaktra or snake's hood ...	2
Śarapuṅkamukha	2
Vaḍiśa or blunt hook	2
Garvaśaṅku or delivery hook ...	1
Aśmarī or lithotomy hook ...	1
Śarapuṅkamukha or tooth extractor ...	1
(d) For wiping out discharges ...	6
For rectum	2
For nose	2
For ears (karṇaśodhana)	2
(e) For application of actual and potential cauteries	11
Jāmboubosṭha, three for each ...	6

Arddhendu or half-moon shaped, for hernia	1
Kolāsthidala for nasal polypus	... 1
Nail-shaped	... 3
(f) For cleansing	... 3
Rectum	... 1
Vagina	... 1
Urethra	... 1
(g) Collyrium probe	... 1
	<hr/> 34

VI. Annyantra or accessory instruments are nineteen in number. To the list of Suśruta he adds the following¹ :—

Goat's gut, silk, time, suppuration, and fear.

B. The sharp instruments of Vāgbhaṭa are twenty-six in number.²

1. Mandalāgra. 2. Vṛddhipatra. 3. Utpalapatra. 4. Adhyarddhadhāra. 5. Sarpāsya. 6. Eṣaṇī:—Gaṇḍūpadamukhā and Sūcī-mukhā. 7. Vetasa. 8. Śārārī. 9. Trikurcaka. 10. Kuśapatra. 11. Ātīvadana. 12. Antarmukha and Arddhacandrāṇa. 13. Vrihibaktra. 14. Kuṭhārī. 15. Kuravakasalā. 16. Aṅguli-śastra. 17. Vaḍiśa. 18. Karapatra. 19. Kartarī. 20. Nakhaśastra. 21. Dantalekhana. 22. Sūcī. 23. Kurecca. 24. Khaja. 25. Ārā. 26. Karnaavedhanī.

¹ अनुयन्त्राश्च यस्मान्न रज्जु वस्त्राश्च सुद्वराः ।

पशान् जिह्वा बालाश्च शस्त्रा नख सुख क्षिप्राः ॥

काष्ठः पाकः करः पादोभयं हृष्येयं तत् क्षिप्राः ।

उपायवित् प्रविभजिदालोच्य निपुणं क्षिप्रा ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² षड्विंशतिः सुकर्मो रैर्घटितानि वधाविधिः ।

शस्त्राणि रोमवाहीनि बाहुष्वेनाङ्गुलानि घट् ॥

सुवपाणि सुधाराणि सुगहाणि च कारयेत् ।

अकरलानि मुष्मात् सुतीक्ष्णावार्त्ततेऽयं ॥

Bhāvamīśra mentions the following blunt and sharp instruments: Eṣaṇī, Jāmbouṣṭha Śālā,¹ Sūci² and knives generally in making incisions which should be shaped like Kharjūrāpatrika, (like the leaf of Kharjūra tree, Phoenix Sylvestris, Roxb.) Arddhacandra, Candravarga, Sūciṃmukha and Abhūṃmukha.³

Pālakapya⁴ mentions ten kinds of śastras :—1. Vṛddhipatra. 2. Kuśāpatra. 3. Mandalāgra. 4. Vṛṭhimukha. 5. Kuṭhāri. 6. Vatsadanta. 7. Utpalāpatra. 8. Śālākā. 9. Śūci or needles. 10. Rāmpaka. Besides these he refers to Vajṛiśa.

Of the blunt instruments he mentions:—Jāmbouṣṭha—(four in number, for application of actual cauteries), Simhādāṃṣṭrā, Godhāmukha, Kaṅkamukha, Kulīśamukha—(for extraction of foreign bodies), Eṣaṇī or probes (three), wound syringe, Vastīyantra, Śālākā or rods, yaṣṭhiyantra, Karkataka, Dyātūha, Makaraka (crocodile), Śārdḍūlamuṣṭhika (tiger's claws), Nandimukha (Turdus Gingihianus).

¹ एषण्णा गतिमन्विष्य श्वरसुत्रानुसारिनीम् ।

सूचौ निदध्यादत्यन्ते प्रोक्षाम्बाय विनिहरित् ॥

Bhāva Prakāśa. II. iv., Nāḍī Vraṇāśdhikāra.

² श्वगन्तुजे भिषगाङ्गौ शस्त्रेणोत्कृत्य यजतः ।

जान्घोष्ठोनाग्रिवर्णेन तस्या वा शलाकया ॥

Ibid, Bhagandarāśdhikāra.

³ गतिमन्विष्य शस्त्रेण हिन्द्यात् खर्जूरपत्रिकम् ।

चन्द्राङ्गं चन्द्रवर्गं सूचौमुखमवास्तुमुखम् ॥

Ibid.

⁴ तत्र शस्त्राणि दशनामसंस्थानानि भवन्ति । तस्या वा हस्तिपत्रम्, कुशपत्रम्, मण्डलाग्रम्, वृद्धिमुखम्, कुटाराकृति, वत्सदन्तम्, उत्पलपत्रम्, शलाका, सूचौ, रम्पकयेति । फालजाम्बवतापिकादर्थोक्ततययेति । एतान्वाग्रिकर्माविधाने चत्वारि चान्यानि शस्त्राणि इत्येवमपि वयावीनं सिद्धदं गोक्षामुखं कङ्कमुखं कुलिशमुखं चेति । तिस्र एवमेषः ।

Hastī Āyūrveda, III. xxx.

CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS.

Now we shall describe the instruments in detail. The Yantras or the blunt instruments will be considered first, and next the Śastras or the sharp instruments.

I. The Svastika yantra or Cruciform Instruments.

The word *svastika* is a technical term signifying one of the twenty-four signs of the Jinas; and it can be represented by two lines crossing each other, the arms of the cross being bent at their extremities towards the same direction. So these instruments may be described as cruciform. They have, as a rule, a length of eighteen *aṅguli*. Their ends should be shaped like the faces of the following ferocious beasts (1 to 8), deer (9), and birds (10 to 24), and the instruments are to be called after their names.¹ They are divided into two classes; the instruments of class I resemble the mouths of lion (*simha*) and tiger (*vyāgra*), while class II comprises the instruments which have the likeness of the faces of birds of prey. The fulcrums of these instruments which are at the middle, are of the size of a *maśūra* (*Ervum lens*). The handles are either rounded off, or bent at an angle at their ends, like an elephant driver's goad—the object being to afford a good grasp of the instrument by the surgeon's hands. The *svastika* instruments are used for the extraction of

¹ तत्र स्वस्तिकयन्त्राष्टदशाङ्गुलप्रमाणानि सिंहव्याघ्रकतरुचक्षुषीपिमाजोरश्मालश्वे
व्वाहककाककङ्कुररचासभासमशवाश्वलुकचित्रिश्वेनयत्रकोचशङ्कराजालिकर्षावभङ्गनन्दि-
मुखमुखाणि मन्त्राकृतिभिः कौलेरववहानि मूलिङ्गुश्वदाश्चवारहाण्यादिविनष्टशब्दोद्धार-
धार्यमुपदिशन्ते ।

foreign bodies impacted in the bones.¹ If the foreign body is visible, extract it by the lion forceps or similar forceps of class I. If it is invisible, it should be extracted by the Heron forceps or similar forceps of class II. Of all the varieties of svastika instruments, the Heron forceps (kaṅka-mukha) is the best, for it can be easily introduced and turned in all directions, and also it grasps firmly and extracts a foreign body with ease and can be applied without any harm to all parts of the body.²

Class I:—

1. Siṁhamukha svastika or Lion-faced forceps:—this instrument is said to have its mouth shaped like that of a lion (Felis leo). It is the principle instrument of the class I. It is

- ¹ तुल्यानि कडसिंहचंकाकादिस्त्रयपविशा ।
मुखैर्मुखानि यन्त्राणां कुर्व्यात्तत् संशकानि च ॥
षष्ठादशाहुलयाभ्यान्वायसानि च भूरिशः ।
समुराकारपथेनोः कण्ठेवद्भानि कौलकैः ॥
विधात् स्तम्भिक यन्त्राणि मूलेऽङ्गुशनतानि च ।
ते हृदये रस्मिर्संलग्नं शल्याहरणमिष्यते ॥

Aṣṭāṅga Hṛdaya. L. xxv.

- ² दृशं सिंहमुखाद्यैर्न गृहं कडमुखादिभिः ।
निर्हरेत्तु शनैः शल्यं शाल्ययुक्तियपेक्षया ॥
निवर्तते साधवनाहते च शल्यं निगृहीत्वोहरते च यच्चात् ।
यन्नेष्यतः कडमुखं प्रधानं स्थानेषु सर्वेष्वधिकारि चैव ॥

Suśrūta Saṁhitā I. vii.

निवर्तते साधवनाहते च
यास्तं गृहीत्वोहरते च यच्चात् ।
यन्नेष्यतः कडमुखं प्रधानं
स्थानेषु सर्वेष्वधिकारि यच्च ॥

Aṣṭāṅga Hṛdaya. I. xxv.

curious that in modern times, the European surgeons use a pair of forceps called the Lion forceps for holding bones firmly during operations. So the Makaramukha of Pālakapya is the Crocodile forceps.

2. Vyāghramukha or Tiger forceps: the mouth of this instrument is like that of a tiger (*Tigris regalis*).

3. Vṛkamukha or Wolf forceps (*Canis lupus*).

4. Tarakṣumukha or Hyena forceps (*Hyena striata*).

5. Rkṣamukha or Bear forceps (*Ursus Americanas*).

6. Dvīpimukha or Panther forceps (*Felis pardus*).

7. Mārjāramukha or Cat forceps (*Felis domestica*).

8. Śṛgālamukha or Jackal forceps (*Canis aureas*).

9. Airbbārūka or Deer forceps (*Cervus elephas*).

Class II:—The birds, in imitation of whose faces the instruments of this class are made, can be identified from the following description of their beaks:—

Birds: 1. Raptatories: they have curved beaks hooked at the extremity.

(a) Strigidæ...owls...strong hooked beaks bent down from base.

(b) Vulturidæ...vultures...long straight beaks bent down at tip.

(c) Accipetridæ...falcons, osprey and eagle...short, usually dentated beaks, hooked at the ends.

2. Pessaries...(a) Lanidæ...shrike...hooked and strongly serrated beak. (b) Cervidæ...crow and blue-jay...beaks strong, thick, somewhat curved anteriorly and slightly notched.

3. Grallatories...Heroidæ or Ardeidæ...herons and krauñca...they have long and powerful beaks with sharp hard

edges, somewhat curved at the point, rarely spoon-shaped, with long neck.

The instruments are—

10. Kākamukha or Crow forceps (*Corvus corone*).
11. Kaṅkamukha or Heron forceps (*Ardea cinerea*).
12. Kuraramukha or Osprey forceps (*Pandion haliaëtus*).
13. Cāsamukha or Blue-jay forceps (*Garrulous* or *Corvus cristatus*).
14. Bhāsamukha or Eagle forceps.
15. Śaśaghātīmukha or Hawk forceps (*Nanclerus furcatus*).
16. Ulūkamukha or Owl forceps (*Strix flammea*).
17. Cillimukha or Kite forceps (*Milivus ictinus*).
18. Śyenamukha or Vulture forceps (*Vulture cinereas*).
19. Gr̥dhramukha or Falcon forceps (*Peregrine falcon*).
20. Krauñcamukha (*Ardea jaculator*); or Carlew (*Numenius Arquatus*).
21. Bhṛṅgarājamukha or Fork-tailed or Butcher-bird forceps (*Lanius excubitor*).
22. Añjalikarṇamukha—birds not identified.
23. Avabhañjanamukha " " "
24. Nandimukhamukha (*Turdus Ginginianus*).

II. The Sandaṁśa or Pincher-like Forceps.

The second class of instruments—the Sandaṁśa¹ or pincher-like forceps—comprises only two instruments: the forceps with and without handles. The first variety is likened

¹ सनिवहोऽनियहय सन्दंशौ षोडशाङ्गुली भवतस्तन्मांससिराकायुगतश्लोद्धारणार्थं-मुपदिश्यन्ते ।

to forceps with arms, used by the barbers for depilating the nasal cavities, while the second variety is like the armless forceps used by the goldsmiths. The former consists of two arms joined crosswise by a pin fixed at about their middle points, and so really is a cruciform instrument but is classed here for its different use in surgery. The forceps without handles consists of two blades soldered at one end. Some commentators like to subdivide the pinchers into two classes according as their ends are rough or smooth. And so Hessler translates :¹ "Duæ forcipes denticulata et non denticulata".

The sandaṁśas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons². Generally they have a length of sixteen aṅguli.

Vāgbhaṭa II mentions two other instruments as modifications of the type :—

(a) One variety has the length of six aṅguli. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.³

Cakrapāṇi also advises us to use a sandaṁśa for epilation, which may be called the Epilation forceps.⁴

¹ Hessler's *Suśruta*. Caput vii. P. 14.

² कौलवद्विपुलादौ सन्दर्शौ षोडशाङ्गुली ।

लक्ष्मिराजावुपिज्ञितं लघु शल्यपकर्षणे ॥ ५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

अतिगुणस्य शल्यस्य सन्दर्शनं समुद्दिष्टम् ।

Hārta Saṁhitā, III. lvi.

³ षडङ्गुलीऽम्बोद्धरणे सूक्ष्म शल्योपपक्षणां ॥ ६ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ See foot-note 2, p. 69.

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. Suśruta calls it *Mucundī*¹, and uses it to hold the pterygium after it has been raised by *vaḍiśa* or hook. It must be then a smaller variety of *mucuṭi*.

A similar pair of forceps, Dr. Erichsen mentions, and says² that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Suśruta mentions *baṁsabidala*³ or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The *sandamśa* instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a *sonnā*. Those with arms have their counterpart in the *sāḍāsi* or a pair of pinchers, still used by the blacksmiths.

III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called *Tāla*.

¹ अपाङ्गं प्रेक्षमाद्यस्य वडिश्चिन समाहितः ।

मुपुष्पगार्ग्यं च मेधावी सूचीसूत्रेण वा पुनः ॥

Suśruta Saṁhitā, vi. xv.

Erichsen's Science and Art of Surgery, Tenth Ed. vol. I. p. 342.

ताननुतेल्लिनाभ्यक्तस्य वंशविदल्लिनापहरेत् ।

Suśruta Saṁhitā, IV. xxvii.

to forceps with arms, used by the barbers for depilating the nasal cavities, while the second variety is like the armless forceps used by the goldsmiths. The former consists of two arms joined crosswise by a pin fixed at about their middle points, and so really is a cruciform instrument but is classed here for its different use in surgery. The forceps without handles consists of two blades soldered at one end. Some commentators like to subdivide the pinchers into two classes according as their ends are rough or smooth. And so Hessler translates :¹ "Duæ forcipes denticulata et non denticulata".

The sandamśas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons². Generally they have a length of sixteen aṅguli.

Vāgbhaṭa II mentions two other instruments as modifications of the type :—

(a) One variety has the length of six aṅguli. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.³

Cakrapāṇi also advises us to use a sandamśa for epilation, which may be called the Epilation forceps.⁴

¹ Hessler's *Suśruta*. Caput vii. P. 14.

² कोलकत्र विवृकारो सन्दर्शो वीङ्गशाहुली ।
लक्ष्मिरासादुपिशित लघ्न शल्यपकर्षणे ॥ ५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

अतिगुणश्च शल्यश्च सन्दर्शेन समुद्भवेत् ।

Hārīta Saṁhita, III. lvi.

³ पङ्कटुलीन्वीकरश्च सूक्ष्म शल्यो पयस्करः ॥ ६ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ See foot-note 2, p. 60.

Similarly in modern times, we remove superfluous eyelashes by the Epilation forceps. Mr. Berry writes¹:—"When the trichiasis is only partial, a temporary improvement is obtained by epilation. In some cases where a few eyelashes only have been left altogether, the patient may procure for himself a pair of forceps, and have the eyelashes removed whenever they cause irritation." Surgical epilation was frequently necessary for trichiasis among the Romans and a similar forceps was in use there.²

In ancient times in India, the barbers used epilation forceps for pulling out grey hairs. In Makha-deva jātaka, we find the following conversations between the king and his barber³:—

"Barber. There is a grey hair to be seen on your head, O King."

King. Pull it out, then, friend, and put it in my hand.

So he tore it out with golden pinchers, and placed it in the hand of the King."

(b) The second variety is known as the Mucunī instrument.⁴ It is a pair of straight forceps, having no curve like that of the sandamśa. It is serrated finely at the open ends. The soldered end has a ring attached to it as ornamentation. It is recommended to be used for removing painful sloughs and pro granulations from a deep-seated abscess. It is also to be used

¹ Practical Ophthalmology, 1904. By G. A. Berry, M.B. P. 52.

² Paulus Aegineta. VI. xiii. (Syd. Soc. Ed.)

³ Rhys David's Buddhistic jātaka stories, Vol. I, pp. 187.

⁴ मुकुटी सूक्ष्म दन्तकुंभुलि रुचकभूषणा ।

मन्वीर त्रयमांसात्ती चाम्पणः श्रीधितस्य च ॥ ७ ॥

Aṣṭāṅga Hfdaya, I. 2

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. Suśruta calls it Mucundī¹, and uses it to hold the pterygium after it has been raised by vaḍiśa or hook. It must be then a smaller variety of mucuṭī.

A similar pair of forceps, Dr. Erichsen mentions, and says² that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Suśruta mentions bamsabidala³ or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The sandaḥśa instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a sonnā. Those with arms have their counterpart in the sājāsī or a pair of pinchers, still used by the blacksmiths.

III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called Tāla-

¹ अयाङ्गं प्रोचमाचस्य वडिश्चिन समाहितः ।

मुमुक्षुर्वाङ्गं मेघावौ मुचौमुचेश वा पुनः ॥

Suśruta Saṁhitā, vi. xv.

Erichsen's Science and Art of Surgery, Tenth Ed. vol. I. p. 342.

तान्मूलैर्लिनाभ्यक्तस्य वज्रविदलेनापहरेत् ।

Suśruta Saṁhitā, IV. xxvii.

yantra¹. The word tāla "has been differently interpreted by the commentators. Bhānumatī gives the alternative reading (tālu i.e., palate) for tāla, so the instruments likely had their ends shaped like the palatine process of fish. Dallana,² however, maintains that tāla means picklock, the ordinary Indian key which resembles a hook. Two of these are joined at one end, the curved ends being kept free, facing one another. The instrument would then resemble the face of a bhetuli fish. Instruments with one tāla or hook resemble one lip of the fish, and those with two tālas represent its entire face. Both Cakrapāṇi and Dallana however prefer to mean by tāla, the scale of a fish."

They have a length of twelve aṅguli, and are shaped like the jaws of a fish. They may be made either with a single blade (ekatāla) or with double blades (dvitāla) soldered at one end, the hooked ends being free. They are intended for the purpose of extracting foreign bodies from the ear, nose and other outer canals of the body. The ear scoop now used by the barbers of India for extracting wax from the ear is a tālayantra.

¹ तालयन्त्रे द्वादशाङ्गुले मत्स्यतालवर्देकतालद्वितालके कर्षणासानाङ्गीशल्यानामाहरणार्थे ।

Suśruta Saṁhitā, I. vii.

ये द्वादशाङ्गुले मत्स्यतालवर्देक तालके ।

ताल यन्त्रं कृते कर्षणाङ्गी शल्यापहारिणी ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² अत्र ताल-शब्देन प्रदेश उच्यते । एतेन एकं तालं प्रदेशी यस्या तदेकतालं, ते ताले प्रदेशौ यस्या तत् द्वितालकम् ; एतेन मत्स्यास्य शल्कवत्प्रतनुमुखैरप्रदेशं एकतालं मत्स्याशल्कवत् प्रतनुमुखं द्विप्रदेशं द्वितालमित्युक्तम् । परिचाष्टसु कर्णादिप्रदेशी ज्ञेयः । अन्ये तु मत्स्यातालवर्देकतालकद्वितालके इति पठन्ति । व्याख्यानयन्ति च मत्स्यादेव भेदुनिमत्स्याः, तस्या लोहमयतालकाकारं मुखं भवति अतस्तन्मुखार्थाकारं यन्त्रमेकतालकं, सर्वमुखार्थाकारं द्वितालकं, तालकोऽथपवारकादिपाटसन्निवन्धनं लोहमयमुच्यते ।

Dallana's Commentary, I. vii.

For removing substances that have fallen into the meatus auditorius, Paul says:¹ "They must therefore be extracted by an earpick, a hook, or tweezers, or by using powerful shaking of the head, while the ear is placed upon some circular board." Albucasis recommends us to use a slender forceps, which resembles the modern dissecting forceps. He also commends for the purpose a hook slightly bent, which is also mentioned by Celsus.²

IV. The Nāḍī Yantra or Tubular Instruments.

The Nāḍī or tubular instruments are described to be of various kinds and to serve many purposes³. They are open either at one or both ends. These are used for the extraction of foreign substances from the natural outlets of the body. They are also recommended to be used as a diagnostic apparatus for inspection of diseases in the canals. They are the means of sucking out fluid discharges, as pus *etc.*, from cavities and they facilitate the performances of other operations. They vary in length and diameter in proportion to the different sizes of the outer canals of the body, or according to the varieties of purposes to be served by them.

¹ Paulus Ægineta, Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² Celsus, VI.

³ नाड़ी यन्त्राण्येकप्रकाराण्येक प्रवीजनान्येकतीमुखान्बुभुवतीमुखानि च तानि स्रोतो-
गतश्लेष्मिद्धारणार्थं रोगदर्शनार्थमाचूषणार्थं क्रियासीकाश्चार्थाश्चेति तानि स्रोतवारपरिवाहानि
यथावीज परिवाहदीर्घाणि च ।

Suśruta Saṁhitā, I. vii.

नाड़ीयन्त्राणि यद्विषाण्येकानेक मुखानि तु ।

स्रोतीगतानां श्लेष्मानामभयानां च दर्शने ।

क्रियाणां सुकरत्नाय कुक्षोदाचूषणाय च ।

तद्विसार परिवाह देव्यं स्रोतीऽनुरोधतः ॥ २ ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

The tubular instruments are used for fistula-in-ano, haemorrhoids, tumours, abscesses, injections into the rectum, vagina and urethra, hydrocele, ascites, inhalations, stricture of urethra and rectum and cupping as by gourd and horns.¹

As examples of the tubular instruments, Vāgbhaṭa II. mentions:—

1. KAṆTHASALYĀVALOKINI² OR THROAT SPECULUM.

To examine foreign substances such as a fish-bone in the throat, the instrument should have a length of ten aṅguli and a circumference of five aṅguli.

Suśruta describes the extraction of a foreign body, made of lac from the throat of a patient by the following device. A heated iron probe or sound should be introduced into the throat of a patient through a tube of copper and made to touch the bit of shellac. The foreign substance would begin to dissolve or soften, and so will adhere to the probe. The rod is then to be cooled by sprinkling water through the tube and the foreign body then should be drawn out steadily with it.³ But other kinds of foreign bodies are to be extracted from the throat by means of a rod-like instrument, one end of which is smeared with melted wax or shellac.

The use of some adhesive substance for extraction of foreign bodies accidentally introduced into the outer passages of the

¹ मसन्द्राशोऽर्बुदग्रन्थिस्तृप्तिमूत्रहृदिदोदरधूमनिरुद्धप्रकाशसन्निरुद्धगुदयन्त्राख-
लाव्यूहयन्त्राणि चोपरिदिष्टादित्यामः ।

Suśruta Saṁhitā, I. vii.

² दशाङ्गुलाईनाहान्त कण्ठशल्यावलीकिनी ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ जातुषे कण्ठासक्तो कण्ठे नाडी' प्रदेष्ट्याग्नितात्र शलाकां तथावगृह्य शीताभिरग्निः
परिविच्य स्थिरीभूतमुद्धरेत् । अजातुषं जलमधूच्छिदलितया शलाकया पूर्वकपदेनैवेक ।

Suśruta Saṁhitā, I. xxvii.

human body was well known to the Greeks and Romans. Paul says:¹ "Stones and such like bodies we extract by wrapping wool round an earpick, and smearing it with turpentine-rosin, or some glutinous substance, and introducing it gently into the meatus auditorius."

2. PAŚCAMUKHA AND TRIMUKHA.

To take a good hold of a four-eared arrow, a speculum having five holes (PAŚCAMUKHA) should be had recourse to; and for a two-eared arrow, a speculum having three holes (TRIMUKHA) would be necessary. The central hole is for the arrow, while the side holes are meant for the ears of the arrow.²

Celsus³ says that when a weapon buried in the flesh has barbs too strong to be broken with forceps, they may be shielded with split writing-reeds (*Calamus scriptorium*), and the weapon thus withdrawn.

Paul says: "Some apply a tube round about the barbs⁴ so that when they draw out the weapon, the flesh may not be torn by the barbs."

In modern times a snare is used instead of a tube. Dr. Erichsen⁵ writes: "The extraction of an arrow is usually attended with little difficulty. But if barbed, special precautions have to be taken. With the view of safely effecting its removal, the snares.....have been devised."

¹ Paulus Ægineta. Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² नाडीपञ्चमुखचिह्ना चतुष्कर्णस्य संवहे ।

वारहस्य द्विकर्णस्य चिह्ना तत् प्रमाणतः ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ Celsus. vii. v.

⁴ The Works of Paulus Ægineta. vi. lxxxvii.

⁵ The Science and Art of Surgery. Vol. I. pp. 343.

3. TUBULAR INSTRUMENTS FOR INSPECTION OF ARROWS.

Again for the inspection of the arrows, various kinds of tubular instruments would be necessary, which will vary according to the shape, length, and circumference of the arrows and their ears.¹

4. ŚĀLYANIRGHĀTANĪ.

The top of this tubular instrument is shaped like the disc of a lotus and is closed. The other end is open and leads to a hollow extending to a fourth part of the tube. It has a length of twelve aṅguli. It is useful for removing an arrow fixed deeply into the body, in different directions and thus helping its easy extraction.² For this purpose Suśruta directs us to use a stone hammer.

The Śālyanirghātani had its counterpart in the female part of the Impellent, mentioned by Paul, for forcing an arrowhead forwards through a part so as to extract it at the side opposite to that of its entrance. It would thus be seen that the function of the Impellent was similar to that of the Śālyanirghātani; the former moved it forwards, while the latter moved the śālya side to side, the object of both being to extract the foreign substance. The Impellent would seem to have been a plain rod of metal pointed at one end (the male part) and hollowed at the other (the female part); the pointed end used to be introduced into the socket of an arrow when it possessed one, and the hollow

¹ वारङ्ग कर्षसंस्थान नाह दैर्घ्यादुरीषतः ।

नाडीरेवं विधाद्यान्वा द्रष्टुं शल्याणि कारयेन् ॥ १० ॥

Aṣṭāṅga Hṛdaya, I. xxv.

² पद्मकर्षिकया मूर्ध्नि सङ्ग्री वादशाहुन्वा ।

चतुर्थं यदिरानाङ्गी शल्यनिघातनी मता ॥

end was meant to fit over the tail in case where the arrow was tanged.¹ The Greeks and Romans recognised the necessity of an arrow being moved about until loosened, if it remained fixed in the bone; and Celsus² directs us to strike it with some iron instrument until it be shaken from the place where it is lodged.

5. TUBULAR INSTRUMENTS FOR PILES.

According to Suśruta³ these should be made either of iron, or ivory, or horn or wood. They are hollow instruments tapering at the end which should be shaped like the teat of a cow. For males, the length is four aṅguli, while the circumference is five aṅguli. In the case of females, however, the tube should be made wider, the circumference being six aṅguli, and longer, the length being equal to the space covered by the palm of the hand. There are two slits on the sides—one for inspection of diseases and the other to allow application of caustic and cautery to the diseased part. The slit measures three aṅguli in length and the pulp of the thumb in breadth. At a distance of a half aṅguli from the margin of the slit, is raised a circular projection, also a half aṅguli high.

¹ Paulus Aegineta, VI. lxxxviii.

² Celsus, VII. 5.

³ तत्र यन् लोहं दालं शार्ङ्गं वाचं वा गीक्ष्माकारं चतुराहुलायतं पञ्चाहुलपरिणाहं पुंसां षड्हुलपरिणाहं नारीणां तलायतं तद्विच्छिद्रं दर्शनार्थमेकं छिद्रमेकं छिद्रान् कर्माणि । एकवारं हि मलस्रावाद्यीनानतिक्रमो न भवति । छिद्रप्रमाणान् बाहुलायतमहुडोदरपरिणाहं षड्हुलमवगच्छं तस्याङ्गुलमधस्तादङ्गुलीकृतोपरिष्ठतः कर्णिकमथयन्नाकृति-समाप्तः ।

Vāgbhaṭa¹ describes two different instruments, one for inspection and the other for medication. They both have the same length and circumference. The former has two slits on the side, while the latter has only one slit, three aṅguli long and the pulp of the thumb in width. The annular projection is turned upwards : the object being the prevention of sudden introduction of the instrument too far inwards.

A similar instrument without any slit on the side is called Śamr². It is advised to be used for exerting pressure over the piles by its introduction into the rectum (Vāgbhaṭa.)

Rectal speculum is mentioned by Hippocrates in his treatise on fistula³ and by Paul in the treatment of piles.⁴ It is called Calopter in contradistinction to the vaginal speculum which is called Diopter. The rectal speculum in the Naples museum is a two bladed instrument working with a hinge in the middle. In modern times, both the varieties of the speculum, tubular and valved, are in use.

For inspection and medication of piles, a tubular speculum is recommended to be used by the veterinary surgeons. In the

- ¹ अथसौ गोमनाकारं यन्त्रकं चतुरङ्गुलम् ।
 नाह्ने पञ्चाङ्गुलम् पुंसो प्रसदानां षड्ङ्गुलम् ।
 द्विच्छिद्रं दर्शने व्याधरेकच्छिद्रं कर्मणि ।
 मध्येऽस्य चाङ्गुलच्छिद्रमङ्गुलीदरं विस्मृतम् ।
 अङ्गुलीच्छितीकृतं कश्चिच्च तद्वृत्तः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

- ² अथार्था तादृग्च्छिद्रं यन्त्रमर्गः प्रपीकनं ॥ १३ ॥

Ibid.

- ³ The Genuine Works of Hippocrates. (Syd. Soc. Ed.) Vol. II. P. 317.

- ⁴ Paulus Aegineta, VI. lxxix.

Aśvavaidyaka, Jayadatta sūri¹ describes the instrument thus: "The surgeon should know the instrument to have the length of six aṅguli. On the two sides, the wise surgeon should make two slits, three aṅguli long and a half aṅguli broad. Through an instrument with two slits, the piles of the horses should be examined. Through a speculum with one slit, the surgical operations, such as incisions &c., should be performed, after having tied the horse and making him lie down".

6. TUBULAR INSTRUMENTS FOR FISTULA-IN-ANO.

These are similar to the instruments used for the inspection and medication of piles, the only difference being the omission of the circular rings in their construction, for otherwise, the projection may rub over the sore if the speculum be introduced deeply.²

¹ यन्तं षडङ्गुलं विद्वान् छिद्रं पञ्चाङ्गुलं भिषक् ।

अधोऽर्धाङ्गुलाविलोके दीप्तेष्वप्यङ्गुलवयम् ॥

उभयोः पार्श्वयोस्तस्य कुर्याच्छिद्रद्वयं दुधः ।

अश्लेष्णेन तु नाहस्य विशिष्टेण विलोकयेत् ॥

एकच्छिद्रेण वे कर्म्म कुर्याच्छिदादि पूर्वकम् ।

पातितस्य सुबद्धस्य तुरङ्गस्य विचक्षणः ॥

Aśvavaidyaka (Bibliotheca Indica). Lilī. vs. 4, 5 and 6.

² क्षिद्रादूर्ध्वं हरीदीडमश्लेष्णस्य यन्त्रवित् ।

ततो भगन्दरे दद्यादेतदहोन्दु सन्निभं ॥

Suśruta Saṁhitā, IV. viii.

सर्वथाऽपनयेदीडं क्षिद्रादूर्ध्वं भगन्दरे ।

Aṣṭāṅga Hṛdaya, I. xxv.

7. TUBULAR INSTRUMENTS FOR THE NOSE.

Nasal-Speculum.

Similar tubular instrument without ring is to be used for examination of nasal diseases as tumours and polypus. It is however shorter and thinner than the rectal speculum. Vāgbhaṭa says: "It is two aṅguli long and admits the index finger in its lumen. The tube has a single slit on the side."¹

He describes nasal tubes for introducing medicated powders into the nose as snuff.² After partially filling the tube with powders, one should blow through the empty end, the other end being put well inside the nasal cavity. Suśruta also uses a tube to blow powder into the nose.³ Caraka⁴ mentions nasal insufflation to cure diseases. Śārṅgadharma⁵ and Cakradatta⁶ describe the nasal tube for insufflation to be six aṅguli long and open at both ends.

¹ प्राणान्मूत्रार्शसामेकच्छिद्रा नाभश्चुलबया ।

प्रदेहिनी परिषादा स्वाग्रमन्दर धनवत् ॥ १५ ॥

Aṅgāṅga Hrdaya, I. xxv.

² ध्यानं विरेचनपूर्वो युज्यात् तं मुखबाधना ।

बहुशुलदिमुखया नाभा भेषजगर्भया ।

Ibid. I. xx.

³ नासाभावे प्राणतर्ध्णमुक्तं नाद्यादियं योऽवपीडयतीत्यः ।

Suśruta Saṁhitā, VI. xxiii.

⁴ मित्रं स्वाग्नाधने चूर्णधेयां प्रधमने हितं ।

Caraka Saṁhitā, VI. xxvi.

⁵ बहुशुला दिवक्ता या नाडी चूर्णकयो धमेत् ।

तीक्ष्णं कोलमितम्बत् वातैः प्रधमनं हितं ॥

Śārṅgadharma Saṁgraha, III viii.

⁶ धापने विरेचनपूर्वो युज्यात् तत् मुखबाधना ।

बहुशुल दिमुखया नाभा भेषजगर्भया ॥

Cakradatta, Nasyādihikāra.

Areteaus says that a quill or reed or a wide long tube may be used for blowing powders into the pharynx. Alexander Trallianus² says that a *calamus scriptorium*, the joints of which have been removed, may be used as an insufflator. Oribasius³ however gives the fullest description of the tube used as a nasal insufflator. "A reed slender and with a straight bore, 6 inches in length, and of such a size that it can be passed in the nares, is taken and its cavity entirely filled with medicament. The reed may be either natural or of bronze. This being placed in the nares, we propel the medicament by blowing into the other end."

In modern times, we advise our patients to do the same thing when powders are prescribed to be thrown into the nose or ears. The cylindrical shaft of the ordinary quill so cut as to be open at both ends will serve the purpose admirably. The nasal insufflator is used now for identical object.

Areteaus⁴ mentions a nasal syringe with a double tube. It consists of two pipes united together by an outlet so that liquid medicine may be injected into both the nasal cavities simultaneously, for injection into each nostril separately, he points out, can not be borne.

It is remarkable that in *Mahāvāgga*⁵ mention is made of single and double nose-spoons. *Nāthu-karaṇi* (i.e., an instrument to hold up the nose, so that the medicated oil

¹ Areteaus, Vol. II., P. 408.

² Alexander Trallianus, IV. viii.

³ Oribasius Collect, xii.

⁴ Areteaus, Ed. Adams, Vol. II., P. 459.

⁵ *Mahāvāgga*, VI. 13. 1 & 2. Sacred Books of the East.

does not run out...Ed.) and Yamaka-nāthu-karaṇi (i.e., one that would go up both nostrils...Ed.). They are recommended to be made of gold, or silver, or bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of chank-shell". (Sacred Books of the East).

To apply oily medicines inside the nasal cavity a cotton wick is first soaked in the oil and then it is pushed well inside the nose. It is recommended also to pour oil into the cavity through a tube, while the other cavity is pressed by a finger (Vāgbhaṭa¹).

To treat a case of fracture of the nasal bones, Suśruta recommends² two straight tubes open at both ends to be introduced into the nasal cavities, after putting the fractured ends in position, either lowering or elevating the raised or depressed end by a rod as required. Then bandages are to be applied. The tubes serve as splints to support the broken ends in position, while through their orifices the patient may breathe without inconvenience.

Similarly Celsus, after replacing the fractured ends in position uses oblong tents sewed round with a thin soft skin as splints into the nostrils; or a large quill smeared with gum, or artificer's glue may be applied in the same way. Paul also

¹ नासापुटं पिचायेकं पर्यायेण निविशयेत् ।
उच्छ्वासो भेषजं प्रनासा पितुनाऽथवा ॥

Aṣṭāṅga Hṛdaya, I. xx.

² नासां सर्वां विहृतां वा क्षत्र्यौ कृतां शलाकया ।
इदम् नासिकयोनायो दिमुखौ संप्रवेशयेत् ॥
ततः पद्मेन संवेष्ट्य हतसेकं प्रदापयेत् ॥

Suśruta Saṁhitā, VI. iii.

says: "And some sew the quills of the feathers of a goose into the rags, and thus introduce them into the nose, in order that they may preserve the parts in position without obstructing the respiration; but this is unnecessary as respiration is carried on by the mouth."¹

Suśruta also advises us to introduce these tubes into the nasal cavities during the performance of the Rhinoplastic operations.²

8. THE AṅGULI-TRĀṆAKA OR FINGER-GUARD.

Vāgbhaṭa says:³ "It is generally made either of ivory or wood. The instrument is shaped like the teat of a cow, and is four aṅguli long. Two slits occur on the sides like those in the speculum for piles."

It protects the finger of the surgeon from being injured by the teeth of the patient and so helps the surgeon in opening the mouth of the patient with ease.⁴

In modern times, finger-guards are used for the same purposes.

¹ Paulus Ægineta, Vol. II. vi, xci. Syd. Soc. Ed.

² सुसंहितं समग्रं यथावन्नाडीद्वेनाभिसमीचा बहा ।

श्रोत्रं चेतानवचूर्णदेव पतङ्गयटौसपुकाद्यनैव ॥

Suśruta Saṁhitā, I. xvi.

³ अङ्गुलिवाचकं दानं वाचं वा चतुरङ्गुलम् ।

द्विचिद्रं शीतनाकारं तदङ्गविज्ञतौमुखं ॥

Aṅgāṅga Hrdaya, I. xxv.

⁴ तच्च वक्त्रं विज्ञतौ, सम्भृतं मुखस्यातुरस्य मुखव्यादानं निमित्तं मुखं सुखकरं स्यात् ।
यत इदं दन्तघातात् रक्षति अत उक्तं मुखमिति ।

Vāgbhaṭārtha Kaumudī, I. xxv.

अङ्गुलिर्दन्तेभ्यो रक्षणाद्यन्तादङ्गुलिवाचमिति नाम ।

Sarvāṅga Sundarī, I. xxv.

9. JONĪ-VRAṆEKṢAṆA OR VAGINAL SPECULUM.

Vāgbhaṭa¹ describes it to be a tubular instrument, sixteen aṅguli long, and six aṅguli in circumference. It consists of four blades, attached at their bases to a ring. The tube tapers gradually, the end is free and looks like the bud of a lotus. To the four blades are soldered four rods in such a way that on pressing their free ends, which pass out of the ring, by the surgeon's hands, the tapering end of the tube would gape widely. The surgeon by regulating the pressure of his hand, may open or close the speculum to any desired extent.

Another kind of vaginal speculum used to be manufactured out of the two horns of a buffalo by dividing each into two longitudinal halves. They should be so paired that their concave surfaces would look towards one another, their ends diverging outwards. So we get a pair of bivalve speculum out of a pair of horns.

The bivalve speculum of horn mentioned above, has its modern counterpart in the pair of speculum known as Barne's or Neugebauer's speculum.

¹ वीनिव्रवेक्षणं मध्ये यद्विरं षोडशाङ्गुलम् ।

मुद्रावद्धं चतुर्भिस्तन्मन्त्रीज मुकुलाननं ।

चतुःशलाकमाक्रानं मूलं तद्विकसेन्दुखे ॥ १० ।

Aṣṭāṅga Hṛdaya, I. xxv.

यस्य यन्त्रस्य कल्पनायां चत्वारिखण्डानि तथा कार्द्वीणि यदा मुद्रिकया बद्धानि मिलितानि च पद्ममुकुलाकारं मुखं, अनन्तरं यद्विरा षडङ्गुलं परिणादवती नाडी स्यात् । ततस्तन्मध्ये प्रत्येकं खण्डसंलग्नं चतस्रः शलाकाः चामुखात् सन्निवेश्य शलाकानानध्यभागे तथा बध्नीयात् यथा शलाकामूलं पीडयेन् यन्त्रस्य मुखं विकसेत् ।

Vāgbhaṭārtha Kaumudi, I. xxv.

The vaginal speculum or Diopter is mentioned by Soranus, Paul¹ and other Greek surgeons. Paul describes its method of working as follows:— "The person using the speculum should measure with a probe the depth of the woman's vagina, lest the stalk (fistula) of the speculum being too long, it should happen that the uterus should be pressed upon. If it be ascertained that the stalk is larger than the vagina, folded compresses are to be laid on the *alæ pudendi*, in order that the speculum may be placed upon them. The stalk is to be introduced, having a screw at the upper part, and the speculum is to be held by the operator, but the screw is to be turned by the assistant, so that the laminae of the stalk being separated, the vagina may be distended." The accounts given by Albucasis² and Haly Abbas³ are similar. These instruments are described to be bivalve, trivalve or quadrivalve. A quadrivalve speculum of the Greeks is identical with the *Joni-vraṇekṣaṇa* of the Hindus; the only difference being that the former is acted by screw mechanism, while the latter is worked on the principle of the lever. Drawings of several sorts of the Greek instruments are given in the surgery of Albucasis and by Schultet.⁴ There are three specimens of vaginal, speculum in the Naples museum, drawings of which are given by Milne. In modern times, we use similar valvular speculum for identical purposes.

¹ Paulus Ægineta, Vol. II. vi. lxxiii. Syd. Soc. Ed.

² Albucasis, *Chirurg.* II. 71.

³ Haly Abbas, *Pract.* ix. 57.

⁴ *Arsenal de chirurg.* tab. 18.

10. TUBULAR INSTRUMENTS FOR WOUNDS.

Vraṇa-vasti or Wound-syringe.

If the wound be caused by deranged air and be very tender, especially if it forms on the lower half of the body, the vasti should be used. In diseases of the urinary organs, such as, obstruction of urine, faulty conditions of urine, impure semen, stone in the bladder and disorders of menstruation, uttara-vasti is necessary.¹

There are two instruments mentioned—one for application of oleaginous medicines to a sore and the other for washing a sinus with medicated lotions. Each consists of a tube and a leather bag. The tube is smooth and rounded and is shaped like a cow's tail.² It is six aṅguli long. The base is broad and admits a thumb, while the end is narrow and admits a pea. There is a circular projection or ring at a short distance from the end. The base is fitted tightly into a bag of thin leather.³

- ¹ वातदृष्टो व्रणोद्यन्तु रुचाद्यव्यर्थवेदनः ।
 अधःकाये विशेषेण तत वस्त्रिन्विधीयते ।
 मूत्राघाते मूत्रदोषे यकृद्दोषेऽग्नरीवणे ।
 तथैवातवदोषे च वस्त्रिरप्युत्तरो द्धितः ॥

Suśruta Saṁhitā, IV, i.

² नाडी व्रणानां खेदप्रयोगार्थं प्रचालनार्थं च हे यन्मे आह यन्मे इत्यादि नाडीव्रणाम्बुह
 चालनाय नाडीव्रणानाम्बुहार्थं प्रचालनार्थं च षडङ्गुलं षडङ्गुलं दीर्घं, वस्त्रियन्त्राकृति वस्त्रि-
 नेत्राकारं इमे गोपुष्पाकारे

Vāgbhaṭārtha Kramudī, I, xxv.

- ³ यन्मे नाडी व्रणाम्बुह चालनाय षडङ्गुलि ।
 वस्त्रियन्त्राकृती मूर्त्तिऽष्टा कलायत्नि ।
 अयतः कर्षिके मूर्त्ति निवडसदृशमणी ॥ १८ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I, xxv

To prevent the tube slipping out of the bag, an additional precaution is taken by tying a knot of thread over the leather covering the tube. For description of the bag, *vide infra*.

Śārṅgadharā¹ however says that the tube should have the thickness of the shaft of a vulture's feather and should admit a moong (Phaseolus Moong). It is eight aṅguli long.

Pālakāpya describes the tube for washing wounds of elephants to be made of copper, and shaped like the karontaka flower. It is sixteen aṅguli long.

In modern times, wound syringes are similarly used to wash the sore with medicated lotions.

For description of the tubes for vṛṣa-dhupana or wound-fumigation, *vide infra*.

11. TUBULAR INSTRUMENTS FOR ASCITES.

Dākodara yantra or Canula.

It may be either metallic or manufactured from the cylindrical hollow calamus of a peacock's feather.² The tube is open at both ends and is of the same calibre throughout. Suśruta advises us to use a pipe of tin, or lead or a feather to drain the fluid, after the abdomen has been tapped.³

¹ वृषवन्धेनैव नैव स्यात् वृक्षमट्टाङ्गुलीभित्तम् ।

मुद्रच्छिद्रमृषपचनलिकापरिणाहि च ।

Śārṅgadharā Saṅgraha, III. vi.

² दिशरा नलिका पिच्छनलिका वा दाकोदरे । १२ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

³ तत्र वृषादीनामन्यतमस्य नाडीदिशरा पचनाङ्गी वा संयोज्या दोषोदक-
मवसिञ्चेत्ततो नाडीमपश्यत्यैतन्नवसेनामग्न्य वृषवन्धेनोपचरेत् ।

Suśruta Saṁhitā, IV. xiv

Celsus describes a lead or copper canula for draining ascites.¹ Paul writes that the tip used to be bevelled off like a writing pen.² It was also employed in empyema.³ Albucasis⁴ mentions a tube of silver or copper or brass having a small hole at the bottom and three on its sides.

In modern times we use a metallic canula of similar shape for draining fluid in ascites.

12. TUBULAR INSTRUMENTS FOR HYDROCELE.

This is practically the same instrument described above. Suśruta⁵ mentions a tube or canula to drain the fluid after tapping the hydrocele with the vṛihimukha śastra or trocar. The Greek surgeons did not describe the operation. They preferred the open incision to puncture.⁶ Rhases, however, describes the operation of puncturing the scrotum for hydrocele.⁷

13. TUBULAR INSTRUMENTS FOR URETHRAL STRICTURE.

Suśruta recommends gradual mechanical dilatation of the urethra by means of tubes made of iron, or wood, or lac, well-smeared

¹ Celsus, vii. 15 & ii. 10.

² Paulus Ægineta, Vol. II. VI. L. Syd. Soc. Ed.

³ Hippocrates, ii. 259.

⁴ Albucasis, Chirrug, ii. 54.

⁵ मूलजां स्वेदयित्वा तु वस्त्रपट्टेन वेष्टयेत् ॥

मेवन्ताः पार्श्वं तोडधत्ता हिष्णेद्वीहिमुखेन च ।

अथान् हिमूखां नाहीं दत्त्वा विस्त्रावयेद् भिषक् ॥

Suśruta Saṁhita, IV. xix.

⁶ Paulus Ægineta, VI. lxii.

⁷ Rhases, Cont. xxiv.

with ghee.¹ He advises us to use the same tube for three consecutive days, then another of larger calibre for three days more, and so on, till the canal be fully dilated. He reserves External Urethrotomy as a last resource.²

14. TUBULAR INSTRUMENTS FOR RECTAL STRICTURE.

Suśruta similarly describes gradual dilatation of stricture of the rectum, using a higher number of dilators after the lapse of three days until the desired effect is attained.³

¹ (a) निरुहप्रकाशे नाडीं लौहीमुभयतोमुखीं ॥

दारवी वा जतुकतो हृताभ्रजां प्रवेशयेत् ।

परिषेक वसामञ्ज शिथिलारवराहयोः ॥

चक्रतैलं तथायोञ्जं वातप्रत्यसंयुतं ।

वाहान्नाहान् स्थूलतरां सम्यङ्नाडीं प्रवेशयेत् ॥

स्रोतोविवर्धयेदेवं शिथिलमन्नञ्च भोजयेत् ।

भिलावा सैवनी मुक्तां मयःक्षतवदाचरेत् ॥

• Suśruta Saṁhita, IV, xx.

(b) निरुह प्रकाशे नाडीं विमुखीम् कनकादिजम् ।

चित्राभक्ता तुलुकादिस्नेहेन परिषेचयेत् ।

तैलेन वा वचदारककैः सिद्धेन च वाहान् ॥

पुनः स्थूलतरा नाडीर्दद्या स्रोतोविवर्धये ।

... ..

... .. रुहगुर्दध्यै च क्रियाक्रमः ॥

Unkradatta, Kṣudraroga Cikitsā.

See also Yogaratnākara, P. 368, where these verses are quoted.

² See 1 (a). चेष्टायाः—सैवनीं त्यक्त्वा शस्त्रेण वा सूचस्रोतः संकोचकारणं चर्मं विदारयेत् । तस्यापि द्वारस्याविपाटे मणिधारमयेवं दारयेदिति ।

Commentary of Śrī Kaṭṭha in Vyākhyā Kusumāvallī (Anandāsram Series), P. 406.

³ मन्निरुह गुर्दे योज्या निरुहप्रकाशक्रिया ॥

Suśruta Saṁhita, IV, xx.

There is no mention of solid bladder sounds in the Sanskrit medical books. But from the above descriptions, it seems beyond doubt that they had a set of dilators for stricture of the urethra and another set of dilators for stricture of the rectum. These dilators were tubes—either metallic or wooden—and had a regular gradation in the increase of their diameters. Cakrapāṇī mentions stricture dilators of gold.¹

In modern times we have also two sets of these instruments—urethral and rectal dilators, numbered in an ascending series according to the increased diameters of these instruments.

15. TUBULAR INSTRUMENTS FOR INJECTIONS INTO THE RECTUM.

Vasti yantra or Rectal Clyster.

Injections into the rectum are to be thrown by means of a tube with a membranous bag tied to its end. The tube is advised to be made either of gold, or silver, or lead, or copper, or brass, or bell-metal, or ivory, or horns, or glass, or precious stones, or wood or bamboo. It should be clean, smooth, strong, and tapering like a cow's tail, and should terminate in a smooth rounded bulb. The tube varies in length and circumference according to the age of the patient as follows:—

I. Caraka.²

Age.	Length of tube.	Opening at the end admits.
6 years	6 anguli	A moong
12 "	8 "	A pea
20 " and over	12 "	A small plum seed

¹ See foot note I (b), Page 124.

² सुवर्णदण्डपुतास्रौति

कांक्षायसाश्चिद्रुमवेणुदन्तैः ।

मलेर्विषाणैर्मणिभिश्च तैर्लैः

कार्पाणि नेत्राणि मुकुर्णिकानि ॥

II. Suśruta.¹

Age.	Length of tube.	Part of tube in bag.	Circumference of tube.	Circumference at end.	Measure of injection.
1 year	6 añjali	1½ anguli	Little finger	Shaft of heron's feather.	2 añjali
8 ..	8 ..	2 ..	4th ..	Shaft of falcon's feather.	4 ..
16 ..	16 ..	3½ ..	3rd ..	Shaft of peacock's feather.	8 ..
50 ..	12 ..	3 ..	Pulp of thumb	Admits a plum stone.	12 ..
70 ..	Same as that of the 16th year.				

षड्द्वादशाङ्गुलं सञ्चितानि षड्विंशतिद्वादशवर्षजानाम् ।

स्युर्मृद्वकर्मसु सतीनवाह्निच्छिद्राणि चत्वार्यङ्गितानि चापि ॥

यथावयोऽद्भुष्ट कनिष्ठकाभ्यां मूलाग्रयोः स्युः परिणाहवन्ति ।

सञ्जुनि शोपुच्छममाकृतौनिःश्रवानि च स्युर्गङ्गिकामुखाणि ॥

स्वान् कर्णिकैकाप चतुर्थमग्नि मूलाग्निने वन्ति निवसन्ते च ।

नारदकोमाह्वयहारिणो वा स्वाच्छौकरो वसिरजस्य वापि ॥

हृदमनुनष्टशिरो विमन्तः कपावरक्तः सुसदुः सुसहः ।

दृशां वयोवीचा यथानुवर्षं निवेष्टुं योग्यस्तु सुवहसुचः ॥

Caraka Samhitā, VIII. iii.

Also quoted in Cakradatta, Anuraṣṇanādhikāra.

¹ तत्र सोऽवत्सुरिकाटशिरष्ट वर्षाणां षड्ददशाङ्गुलं प्रमाणानि कनिष्ठिकामानिका मध्यमाङ्गुलि परिणाहान्यथेऽथर्द्धाङ्गुलाश्च तृतीयाङ्गुलं सन्निविष्ट कर्णिकानि कङ्कश्येन वर्द्धिपथं नाडीतुल्यं प्रवेशानि सुदृमापकलायमाव स्रोतांसि विदध्याग्नेचाणि तेषु त्वास्यापमाद्रव्यं प्रमाणमातुरं हस्तमन्त्रिनेन प्रसूतेन सम्प्रितौ प्रसृतौ दौघत्वारीऽष्टौ विधेयाः ।

भवति चाप ।

वर्षोत्तरं नेत्राणां वसिमानसा चैव हि ।

वयोवल्गवीराणि समौघा वर्द्धयेद्विधिं ॥

षड्विंशतेऽर्द्धे द्वादशाङ्गुलं मूले द्वाष्टोदर परिणाहमये कनिष्ठिकोदर परिणाहमये त्राङ्गुल-सन्निविष्ट कर्णिकं षट्पञ्चमाङ्गुलं प्रवेशं कोलाच्छिद्रमावच्छिद्रं क्षिप्रकलायमावच्छिद्रमित्येकं । सर्वानिमूलं वसिनिवस्यन्नाथं द्विकर्णिकानि । 'त्वास्यापन द्रव्यं प्रमाणं' तु विहिता द्वादश प्रसृताः । सप्तनैसर्ग्ये नेत्रं प्रमाणमितदेवद्रव्यं प्रमाणम् । शिरस्तवर्षवत् ।

तत्र नेत्राणि सुवर्षं रजततामशोरीति दन्ताग्रहमन्त्रितसारमगानि श्रवानि हृदानि शोपुच्छाकृतौशान्जुनि गृध्रिका मुखानि । वस्यथाह्वयानां सदयो नाति बहला हृदाः प्रमाथवन्ती गोमहिषवराहाजोग्ध्याणां ।

Cakradatta¹, Śārṅgadharā and Bhāva Miśra² follow Caraka as regards measurement. Kharapāda³ also gives a similar description.

¹ See foot note 2, Page 125.

² नेत्रं कार्यं सुवर्णादिधातुभिश्चवेणुभिः ।
नलेह्नैर्लेपिषाणैर्वैर्माणिभिर्ज्वा विधीयते ॥
एकवर्षात् षड् वर्षं यावन्मानं षडङ्गुलम् ।
ततो वादशकं यावन्मानं स्वादष्टसंमितम् ॥
ततः परं वादशभिरङ्गुलैर्नेत्रदीर्घता ।
मुद्राक्षिद्रं कलायाभं क्षिद्रं कोलास्थिसन्निभम् ॥
गोपुच्छसन्निभं मूलं स्थूलं तथ्यात् क्रमात् ऊर्ध्वं ।
यथासंख्यं भवेद्देवं शृणु गोपुच्छसन्निभम् ॥
आतुराङ्गुष्ठमानेन मूलं स्थूलं विधीयते ।
कनौत्तिकापरौष्णाहमे च गुटिका मुखे ॥
तन्मूलं कर्णिके रे च कार्यं भागाद्यतुर्धकात् ।
क्षेत्रयेत् तव वलित्वं बन्धयविधानतः ॥
सराज्यकरमवां सक्षिपस्यापि वा भवेत् ।
भुवकोमसा वसिन्ता तदक्षानि च चक्षुः ॥
कथाघरक्तः मुखद्वलिः खिन्धो दृढोद्भितः ।
प्रथमोन्तु नेत्रं स्यात् शकामटाङ्गुलीन्धितम् ॥
मुद्राक्षिद्रं यथोपलनिकापरिणाहि च ।

Śārṅgadharā Saṁgraha, III, १.
Bhāva Prakāśa, I, II.

³ वसिनेतसज्जु शृङ्गं सङ्गुलिकामुखम् ।
भवेद्गोपुच्छसंस्थानं सुप्रवाहं विकर्णिकम् ।
या विभागप्रणयने मर्यादा कर्णिका भवेत् ।
रे कर्णिके चोपरिटावसाधारिष्यवान्तरं ।
साङ्गुलकपरीणाहं मूलं नेत्रस्य शक्यते ।
मध्यं त्वनामिकातुल्यमर्थं तुल्यकनिष्ठिकं ।
स्त्रो साङ्गुलि प्रमाणेन दैर्घ्यं स्याद् वादशाङ्गुलम् ।
कर्कोभुप्रवहच्छिद्रं श्रेतमन्यदावयः ।

Hārīta¹ advises us to use a bamboo tube four aṅguli long, which is to be introduced into the rectum up to two aṅguli.

As a general rule, Caraka writes that the broad and the narrow ends of the tube are to be equal to the patient's thumb and little finger respectively, in circumference. The orifice at the end of the tube is to be kept closed by a wick, so that no foreign body may enter the lumen of the tube to occlude it. The plug may be easily removed when the tube is required for use, and then replaced.

Towards the narrow end of the tube is a projection or ring at a distance of about two aṅguli from the extremity. The height of the projection varies with the size of the tube at the base. It acts as a bar to the further introduction of the tube inside the rectum than required. Towards the base are two similar projections, two aṅguli apart from each other. To the one near the base is firmly tied the leather bag, so that the tube may not slip away suddenly during forcible compression of the bag. The other is meant to afford a firm grasp by the surgeon, so that the tube may not move during its introduction into the rectum. These projections are to be made of thread or a piece of cloth and are to be so shaped as to resemble the end of the proboscis of an elephant.

As regards the leather bags, they are recommended to be

विंशद्वादशपङ्कथे द्वादशाष्टपङ्कथं लम् ।

ककंशूकं सतीदारमुखं विद्वद्बम् ॥

Kharapāda quoted in Sarvāṅga Sundarī, I. xix.

¹ चतुरङ्गुलां विंशमर्यां नाडीं प्रतिलक्षणं कृत्वा त्वया वस्त्रप्रतिकर्म्यं कुर्यात् । * * *

गुदाभ्यन्तरे द्वादशलमात्रं नाडीं सञ्चारयेत् सुधीः ।

Hārīta Samhitā, V. iii.

made of the bladder of cows, or buffaloes, or hogs, or goats, or lambs. The bladder is to be well cleaned first with lime and water, so that no unpleasant smell may be emitted by the decomposition of its muscular tissue, then dyed red with Mañjiṣṭhā (*Rubia Cordifoliatum*) or with Haritakī (*Terminalia Chebula*, Retz.) and thoroughly dried. The bags are recommended to be soft, durable, entire and capacious. If the bladders of these animals are not available, the bags are to be manufactured from a frog's skin, or the peritoneum (one-fourth part would suffice) of any beast, or a piece of leather or a piece of very thick cloth. The size of the bag varies according to the age of the patient. It is to be firmly tied over the first projection at the base of the tube.

In the Siddhīsthāna Chapter XI of the Caraka Saṁhitā,¹ there is a passage showing that veterinary medicine was well-known to the ancient Hindus at a very early period. This portion was edited by Dṛḍhavaḥa and it is impossible to decide whether the passage refers to Agniveśatantra or not. It runs as follows:—
 “Then the disciples asked: ‘How are clysters to be made in cases of animals such as elephants, camels, cows, horses, lambs and goats?’ To this, the sage Ātreya explained the clysters for

¹ अष्टाङ्गसिद्धिस्तोत्रे सचरुसिद्धिस्तोत्रे विधिस्तोत्रे पुनः प्रचोदितः ।
 अजाविकेसीन्य गजोदयोर्वा गवाक्षयोर्वसिमुशान्तिमाद्विधम् ॥
 अजाविकादन्तमुवसिमुत्तरं वदन्ति वसिं विपरीतकृपम् ।
 सुवसिमटादशोऽग्राङ्गुलं तथैवनेवञ्च दग्धाङ्गुलं क्रमात् ॥
 गजोदयोऽद्याव्यजवसि सन्धौ चतुर्थभागे च सकर्षिकं वदेत् ।
 प्रस्रवस्वजाव्योर्हि निरुहमावा गवादिषु धिनिगुणो यथा वलम् ।
 निरुह उदुस्व तयादिकवयं गन्धश्च तद्विधस्तनुवासनेऽष्टमः ॥

animals in the following manner. The leather bag of the vasti-yantra should be made of a buffalo's bladder for goats, lambs, elephants, cows, camels and horses. The vasti for these animals is known as suvasti and uttara-vasti as uttara-suvasti. The tube of the suvasti should be eighteen aṅguli long for elephants and camels, sixteen aṅguli for cows and horses, and ten aṅguli for goats and lambs. Like the vasti yantra used for men, it should have a projection at the junction (of the tube with the bladder) and another at the fourth division of the tube from the end."

In the *Aśvavaidyaka*¹ the tube for the horse is thus described : "The tube should be made either of wood, or metals, or horn, or bamboo, or reeds. Its length should be twelve aṅguli and circumference six aṅguli. The wise surgeon should make the tube of such a calibre as to allow a plum seed to pass through it easily. It should be straight, polished and tapering from the base. At a distance of four aṅguli from the end of the tube, a projection should be raised, while for tying the leather bag firmly to the tube, two projections ought to be constructed at the base".

*Pālakāpya*² describes the rectal clysters for elephants. He advises that these are to be made either of wood or bamboo. The end is bulbous and the surface smooth. The length

¹ काष्ठैर्दंष्ट्रयोर्मिश्रं शङ्खवृश्नलादिभिः ।

वादशाङ्गुलदीर्घं तु परिणाहे षडङ्गुलम् ॥

कीलास्थिमातृच्छिद्रं तु कुर्यान्निवे विचक्षणः ।

मूलादनुक्रमं शक्वांसस्य तु विधिमतः ॥

त्यक्ताङ्गुलानि चत्वारि कर्षिकालस्य कारयेत् ।

पुटकस्य प्रवक्ष्यामि मूलं ते चापि कर्षिके ॥

Aśvavaidyaka, XVI. vs. 2—4.

² *Pālakāpya's Haati-Āyurveda*, Sec. IV. Ch. V.

length of the tube varies, the most convenient being sixteen aṅguli for men and sixty-eight aṅguli for elephants. The projections at the base of the tube should be twelve aṅguli high. He describes in detail the method of introduction, position of the elephant, etc.

Dr̥ghavala advises us to reject the following eight kinds of tubes and eight kinds of bags¹ :—

I. Tubes—

1. Hrasva or too short : For the injection does not reach the proper place.
2. Dirgha or too long : For the injection passes beyond the proper place.
3. Tanu or too thin : The injection can not pass through the tube easily and so the bag may burst.
4. Sthūla or too thick : The tube pulls the mucous membrane of the rectum and anus backwards and forwards during its entrance and exit.
5. Jīrṇa or old, weak and delicate : The tube may break inside the rectum during its introduction and so cause injury to the gut or anus.

¹ 'इस' दीर्घं तनुद्यूतं जीर्णं शिथिलवन्धनम् ।
 पार्श्वेच्छिद्रं तथा वक्रमटी नेत्राणि वर्जयेत् ॥
 अप्राप्तातिमतिशोभकवैषम्यलक्षणस्रवाः ।
 गुदपीडा गतिजिह्वा तथा दोषा यथाक्रमम् ॥
 नासलच्छिद्रविषमस्फुल्लजालकातलाः ।
 क्षिप्रः क्षिप्रश्च तानटी वलीन् कर्मसु वर्जयेत् ॥
 गतिवैषम्यविसलसाय्यदीयाद्यदिस्रवाः ।
 फेनिलक्ष्णतथाशूलं वस्त्रेः स्याद् वस्तिदीपतः ॥

6. Śīthilabandhana: The tubes do not fit the bags well, so during compression of the bags, the injected fluid runs out by the side of the tube.
7. Pārśvacchidra or leaky: Having slit on the side, the tube may injure the soft parts by rubbing against them.
8. Bakra or curved: The motion of the injected fluid would be curvilinear. It will strike a side of the rectum and so would not go inside the gut.

II. Bags—

1. Mārśala or fleshy: The bag emits bad smell.
2. Chidra or leaky: The injection escapes outside.
3. Viṣama or uneven: Parts are unequally compressed and so the injection does not issue in a forcible jet.
4. Sthūla or thick: It is difficult to grasp the bag and so it can not be forcibly compressed.
5. Jālaka or having a network: The injection comes out.
6. Vātala or hollow, airy and incompressible: If air can not be expelled out, froth forms in the injection; and so air is pumped into the rectum.
7. Chinna or torn: The injection flows down.
8. Klinna or moist: The injection can not be forced out.

Suśruta mentions eleven defects of tubes and five defects of bags of the Vasti yantra.¹

¹ अतिमृदुले कर्कशमवनतमकुम्भित्रं सन्निकृष्ट विप्रकृत कर्षिकं मूत्रातिच्छिद्रमतिदीर्घ-
मतिश्लक्ष्मिणिकादश्च नैवदोषाः । बहुलताश्रया सच्छिद्रता प्रक्षीर्णता दुर्बलहतेति पञ्चवर्णि
दोषाः ।

I. Tubes—

- | | | |
|-------------------------|----------------------|---|
| 1. Atisthūla : | Too thick. | } Such tubes injure the rec-
tum and so cause pain. |
| 2. Karkaśa : | Rough. | |
| 3. Avanata : | Curved. | |
| 4. Ann : | Too thin. | } It becomes use-
less to inject
fluids into the
rectum. |
| 5. Bhinna : | Broken. | |
| 6. Sannikṣ ṭa Karṇika : | Projection near ? | |
| 7. Viprakṛṣṭa Karṇika : | Projection distant ? | } Injure the rec-
tum which bleeds. |
| 8. Sūkṣma : | Small orifice. | |
| 9. Atihrasva : | Too short. | } It becomes difficult to inject
as the fluid comes out. |
| 10. Atichidra : | Large orifice. | |
| 11. Atidirgha : | Too long. | } Too much fluid passes into
the rectum and so pain is
complained of. |

II. Bags—

- | | | |
|------------------|-------------------|---|
| 1. Vahalatā : | Fleshy. | } It is difficult to tie the bags
over the tubes properly. |
| 2. Prastīrpatā : | Large. | |
| 3. Sacchidratā : | Perforated. | } No fluid can be forced
into the rectum and so
the instrument is use-
less. |
| 4. Durviddhatā : | Difficult to tie. | |
| 5. Alpatā : | Small. | Small quantity of fluid passes into the
rectum. |

गुदे भवेत् चतं रक् च साधनं पूर्ववत् भूतं ।

वासत्र कर्णिके नेत्रे भिन्नेऽथौ वायुपायकः ॥

अवसेको भवेदलोत्सादादोषाविवर्धयेत् ।

प्रकृष्ट कर्णिके रक्तं गुदमध्यं प्रपीडयान् ॥

चरमवापि पिताग्री विधिर्वसितय पिच्छिलः ।

अश्वेतलक्ष्मीतमि च केशो वसितय पूर्ववत् ॥

प्रत्यागच्छन्तः कुर्याद्दीगान्वलि विघातजान् ।

दीर्घे महाक्षीतमि च ज्ञेयमव्यवपीडयत् ॥

प्रक्षीर्णे बहले चापि वक्तो दुर्बल दीयवत् ।

वक्तावन्येऽन्यता वापि टव्यस्यान्वयुना मताः ॥

टव्ये चो वापि भिन्ने च विज्ञेयः भिन्न नेत्रवत् ।

16. UTTARA-VASTI.

Urethral, Vaginal and Uterine Tubes.

Injections into the urethra and vagina are also recommended to be thrown in by similar contrivances: the tubes being adopted in length and circumference to the length and breadth of the passages for which they are intended.

1. Tubular Instruments for the Urethra.

The tubes intended for applying medicines into the male urethra is recommended to be twelve aṅguli long. Suśruta¹ advises us to use tubes fourteen aṅguli long. It is to be made of gold and is called Puṣpanetra. Its circumference is equal to that of a stalk of flower of Jāti (Jasminum Grandiflorum) or Mālatī (Echites Crayophyllata, Rox.), and the lumen of the tube allows a mustard seed to pass through it. It is provided with an annular projection just at the central part. Caraka² says that

¹ वसेरुत्तरसञ्ज्ञविधिं वक्ष्याम्यतः परं ॥
चतुर्दशाङ्गुलं नैवमातुराङ्गुलं सञ्ज्ञितम् ।
मालतीपुष्पहन्तार्यं द्विदं सर्पप निर्गमम् ॥
मेद्राग्रामसमं केचिदिच्छन्ति खलु तद्विदः ।
खेह प्रमाणं परमं कुक्ष्यात् प्रकीर्तितः ॥
पञ्चविंशदधोभावां विदध्याद् वृद्धिकल्पिताम् ।
निविटकर्णिकं मध्ये नारीणां चतुरङ्गुली ॥
मूत्रस्रोतः परीक्षां मुद्र वा हि दशाङ्गुलं ।
तासान्पत्यमार्गे तु निदध्याच्चतुरङ्गुलम् ॥
द्वाङ्गुलं मूत्रमार्गे तु कन्यागान्त्वैकमङ्गुलम् ।
विशेषं चाङ्गुलं तासां विधिवद्वर्त्तते यथा ॥

Suśruta Saṁhitā, IV. xxxvii.

² पुष्पमेतच्च वैभं स्यात् मूत्रमौत्तरवर्त्तिकम् ।

it has two projections while Vāgbhaṭa¹ describes three. The bag is to be made of goat's bladder. A probe is first passed into the urethra to examine its condition and then the tube is introduced up to the length of six *āṅguli*. The bladder which contains the injection and which is tied tightly round the tube, is then compressed to force the fluid into the urethra. The tube of course, varies in size according to the dimensions of the organs of generation.

For the female, the *puspanetra* is described to have the length of ten *āṅguli*. The projection is at a distance of four *āṅguli* from the base. The circumference of the tube varies according to the width of the prethral canal. The calibre of the tube allows a moong to pass through it.²

जातीयुषस्य हन्तेन समं गोपुच्छमंस्थितम् ।

रीष्यं वा सर्वपक्वितं द्विकर्णं द्वादशाङ्गुलम् ॥ ४८ ॥

Caraka Saṁhitā, VIII, ix.

¹ चातुराङ्गुलमानेन तत्रैवं द्वादशाङ्गुलं ।

हसं गोपुच्छवत् मूलं मध्ययोः कृतं कर्णिकं ।

सिद्ध्यर्थं प्रवेशार्थं त्र्यङ्गुलं केमादि मध्यमे ।

कुन्दावमारं सुमनः पुष्पहन्तोपमं हृदं ।

तस्य बलिर्दुलघुर्मात्रा शक्तिर्विकल्पा वा ॥

* * * *

नेत्रं दशाङ्गुलं मुद्गप्रवेशचतुरङ्गुलं ।

अपत्यमार्गे योज्यं स्वाङ्गाङ्गुलं मूत्रवर्त्मनि ॥

मूत्रकृक्विकारेऽप्यग्नाया लोकमङ्गुलम् ।

Aśtāṅga Hṛdaya Saṁhitā, I, xix.

² पुष्पनेत्रं प्रमाणानां प्रमदानां दशाङ्गुलम् ।

मूत्रस्रोतः परीणाहं मूत्रस्रोतोऽनुवाहि च ॥

सर्वमार्गे तु मारीणां विधेयं चतुरङ्गुलम् ।

द्वाङ्गुलं मूत्रमार्गे तु बालाया स्त्री कर्मङ्गुलम् ॥

Caraka Saṁhitā, VIII, ix

Catheters.

It is curious to find no description of so important an instrument as the catheter. Injections were thrown into the urethra but the tube used was always a straight one, having the length of six aṅguli; so it could not possibly have reached the bladder in the male, and nowhere has the claim been put forward for it to have done so. The tube might have served well for the females. The female catheter of the Greeks, as preserved in the Naples museum, is 0.98 mm. long and is straight throughout (Milne).

In the Atharvaveda Saṁhitā,¹ however, we find a hymn, unmistakably alluding to the use of catheter in ancient times.

Against obstruction of urine with a rod.

"This hymn is intended to be 'used in a rite for regulating the flow of urine'. The reed implies some primitive form of a fistula urinaria, the vastiyantra (one of the nāḍīyantrāṇi) of the late physicians—who however do not appear to have made frequent uses of it".

* * * * *

6. What in thine entrails, thy (two) groins, what in thy bladder has flowed together—so be thy urine released, out of thee with a splash! all of it. (In the groin are two vessels located in the two sides affording access to the receptacle of urine).

7. I split up thy urinator, like the weir of a tank—so be thy urine released, out of thee, with a splash! all of it.

8. Unfastened (be) thy bladder orifice, like that of a water-

¹ Book 1. 3. Whitney's translations and annotations.

holding sea—so be thy urine released, out of thee, with a splash! all of it.

9. As the arrow flew forth, let loose from the bow,—so be thy urine released, out of thee with a splash! all of it".

2. Tubular Instruments for the Vagina.

Similarly injections were thrown into the vagina. The vaginal tube should be thicker than the urethral tube and in circumference should be equal to that of the little finger. It should be introduced into the vaginal canal up to a distance of four *aṅguli*, whereas into the urethra, the tube was allowed to enter up to a distance of two *aṅguli* only in the adults and of one *aṅguli* only in the girls.¹

3. The Uterine Tubes.

The *uttara-vasti* comprises the urethral syringe—male and female—and the vaginal and uterine clysters. No distinct uterine tube is described in the text books. But *Suśruta*² says

१ दादशाङ्गुलकं नेत्रं मध्ये च कृतकर्णिकम् ।
मालतिपुष्पवृत्ताभ्यङ्गिद्रं मधेपनिर्गमम् ॥
* * * * *
स्त्रीणां कनिष्ठिकाशूलं नेत्रं कुप्याद्दशाङ्गुलम् ।
सुद्वप्रवेष्ट्यं योज्यच्च योन्मन्त्रयतुरङ्गुलम् ।
दाङ्गुलं सूत्रमार्गे च सूक्ष्मं नेत्रं नियोजयेत् ।
सूत्रकृच्छ्रविकरिषु बालानामिकमङ्गुलम् ॥

*Sārngadhara Samhitā, III. vii.
Bhāva Prakāśa, I. ii.*

२ उर्ध्वजात्रै स्त्रियै दद्यादुत्तानाथै विचक्षणः ।
कक्षतरस्य कक्षायै दद्यात् सुसुदु पीडितं ।
विकर्णिकेन नेत्रेण दद्याद्योनिमुच्छं प्रति ।
गर्भाशयं विद्युत्कार्यं खेहेन विद्युत्सेन तु ।
अप्रत्यागच्छति मिथक् वसाङ्गुलरसंज्ञिते ।

that to apply *uttara-vasti* to a female, she is advised to lie supine, keeping her knees flexed and well raised. For a girl the quantity of injection is one *prasṛta*.

To purify the uterine cavity, apply a clyster of twice the quantity of oleaginous medicines, inside the vagina by means of a tube having three rings. If after the application, the oily medicine does not flow out, then apply a second clyster containing medicines of the group called *śodhana* or purifiers, into the rectum; or let the clever surgeon introduce a probe into the space of the clyster; or press under her navel deeply by his closed fist. As the object of the injection is to clean the cavity of the uterus, there can be no doubt that a uterine tube is referred to in the passage. Again the precautions recommended if the injections do not come back easily, point to a uterine tube to have been used, for injections into the vagina can not be delayed in coming out. The Hindu writers often confounded the intra-uterine and urethral injections with the vaginal clyster. Caraka¹ says: "The *uttra-vasti* is to be used for the females during the period of menstruation, for then the uterus, being in a condition fit for impregnation, has its mouth open and so can easily be reached by the injection." This shows that uterine medication to be the object aimed at by the clyster.

भूयो वर्त्तिं विदध्यात् संयुक्तं शोधनैर्गन्धिः ।

गुदे वर्त्तिं निदध्याद्वा शोधनद्रव्य संसर्ता ।

प्रवेशाद्वा मत्तिसान्त्वस्तिहारमथैषणौम् ।

पौड्रवेदाप्यधोनाभेर्बलेनोत्तरमुदित्वा ।

Suśruta Saṁhita, IV. xxxvii

¹ स्त्रीणां चार्धवकाले तु प्रतिकर्म्यं तदाचरेत् ।

गर्भासना मुखं खेपं तदादत्ते ह्यपात्रता ॥

गर्भं योनिमुदा शीघ्रं जिते यज्जाति मारुते ॥

Caraka Saṁhita, VIII. ix.

The Greeks were no better, for Milne also complains: "It is difficult to separate ancient descriptions of injections into the vagina from those into the uterus, for the terms for the two parts are frequently interchangeable". Again he says: "It is probable that at other times under the heading of 'injections of the bladder', only irrigation of the urethra is meant".¹

18. TUBULAR INSTRUMENTS FOR INHALATIONS AND FUMIGATIONS.

The tubes for smoking were made, like the vasti tubes, of various metals, or glass or wood. Caraka² describes it as a straight tube having three pouches. The end of the tube is equal in diameter to that of a plum seed. Śārṅgadharā³ adds that a reed or bamboo pipe will also serve the purpose. It is described as a straight tube, the broad base of which admits the patient's thumb while the narrow end, a plum seed. Suśruta⁴ describes the base

¹ Græco-Roman Surgical Instruments, P. 107-8.

² चतुर्विंशतिकं नेत्रं सङ्गुलीभिर्विरेचने ।
 द्वाविंशद्दङ्गुलं खेदे प्रयोगे चाहमिष्यते ॥
 कज्जुलिकोपफलितं कोलास्यप्रमाथितम् ।
 वस्तिनेच समद्वयं धुमनेच प्रयस्यते ॥१६

Caraka Saṁhitā, I. १.

³ धुमनाङ्गी भवेत्तत्र विस्फुला च विपरिका ॥१०
 कनीटिका परीणाहा राजमाषागमानरा ।
 धुमनाङ्गी भवेद्द्वीचा शनने रोगिणोऽङ्गुलैः ॥११
 चत्वारिंशन्मितस्तदङ्गुलविंशद्विन्दुः स्यात् ।
 तीक्ष्णं चतुर्विंशतिभिः कामजं षोडशोन्मिते ॥१२
 दशाङ्गुलिर्बामनीये तद्यास्याद्वयनादिका ।
 कलायसङ्गुलव्यूता कुलत्यागसरन्ध्रा ॥ १३

Śārṅgadharā Saṁhitā, III. ix.

⁴ तत्र वस्तिनेत्रद्वयं धुमनेचद्रव्याणि व्याख्यातानि भवन्ति । धुमनेत्रम् कनीटिका परिणाहमये कलायसार्त्तं स्रोतोमूलाङ्गुलपरिणाहं धुमवनिं प्रवेश स्रोतोऽङ्गुलान्ध चत्वारिंशं प्रायोगिकं । द्वाविंशत् खेदने । चतुर्विंशतिर्विरेचने । षोडशाङ्गुलं कामजे वामनीये च ।

and end of the tube to be equal in circumference to that of the thumb and little finger respectively. The orifice should allow a common pea to pass easily through the tube. Vāgbhaṭa¹ says that there are three pouches or dilatations of the tube, shaped like the half-open buds at equal distances from each other. The tube is supposed to consist of four equal parts. The first pouch is located at the end of the first part, the second and third pouches at the ends of the second and third parts respectively. Cakradatta² also describes it similarly.

Dṛḍhabala³ mentions another method of inhalation. He makes a paste of the medicines prescribed and smears it on a piece of silk cloth. This is then to be rolled round like a wick. This wick is to be dipped in ghee before use, and fire lit at one end, while the patient is to smoke it through the other end.

एते अपि कोलास्थिमात्रं चिद्रे भवतः । दधनेनमटाङ्गुलं त्रयधूपनाथं कलायपरिमणम् ।
कुलस्थवाहि स्रोत इति ।

Suśruta Saṁhitā, IV. xi.

- ¹ वस्ति नेत्रं मम द्रव्यं विकीर्णं कारयेद्भुजु ।
मुलायेष्ट-कोलास्थिं प्रवेशं धूमनेतकं ।
तौष्णं स्नेहनं मध्येषु तौष्णि चत्वारि पञ्च च ।
अङ्गुलीनां कमात् पातुः प्रमाणे नाटकानि तत् ॥६॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxi.

- ² कञ्जुविकीर्णफलितं कोलास्थ्यदप्रमाणितम् ।
वस्तिनेतसमद्रव्यं धूमनेतं प्रशस्यते ।
माहंस्त्राशयुतः पूर्वाङ्गल प्रायोगिकादिषु ।
नेत्रे कामहरे वागङ्गीनः शेषे दशाङ्गुलः ॥

Cakradatta, Dhūmapānādhikāra.

- ³ प्रपुन्दरीकं मधुकं शार्ङ्गं टां समनःशिलां ।
सरिचं पिप्पलीं द्राचमिलो मुरसमञ्जरीम् ॥
कृत्वा चर्तितं पित्तकृमं जीमचेलानुवर्जिताम् ।
घृताक्लामनु च क्षीरं गुडोदकमवापिवा ॥

Caraka Saṁhitā, VI. xxii.

Both Caraka¹ and Śārāgadharā² advise us to make tubes of medicines, the fumes of which are advised to be smoked in the following manner:—Powder the medicaments and make a paste; measure one karsa; take a smooth reed (*Saccharum sara*, Rox.) twelve aṅguli long. Apply the paste round the reed, for a length of eight aṅguli. Dry it in shade. Remove the reed, leaving a dried tube of the paste. When required for smoking, light one end of the tube with a burning wick and smoke through the other end.

Caraka³ describes another inhaler, which consists of two earthen basins (*śoraba*) placed upon each other, their edges being pasted with flour. The upper one is perforated at the centre for the reception of one end of the tube, the patient puts the other

- ¹ पिष्टा लिप्तेच्छरेषीकां तां वतिं यवसन्निभां ।
 अङ्गुष्ठमक्षितां कुर्यादष्टाङ्गुलमनां निषक् ॥
 शुष्कां निरर्भां तां वतिं धूमनेवापितां नरः ।
 खेहाक्तमधिमुष्टां पिबेत् प्राथीगिकीं सुखम् ॥ ६ ॥

Caraka Saṁhitā, I. v.

- ² अयेषिकां प्रविपेक्ष मुष्टां वादशाङ्गुलाम् ।
 धूमद्रव्यस्य कल्के न लेपयान्ताङ्गुलः क्षतः ॥
 कल्कं कर्पमिते क्षिप्वा छायां शुक्लं कारयेत् ।
 इषिकामपनीयाय खेहाक्तां वर्तिमादरात् ॥
 अङ्गुरिर्दोषितां कृत्वा धृत्वा नेत्रस्य रश्मुके ।
 वदनेन पिबेद्धूमं वदनेनैव संयोजित् ॥
 नासिकायां ततः पीत्वा मुनिनैव वमेत् सुधीः ।

Śārāgadharā Saṁgraha, III. ix.

- ³ मधुच्छिष्टं सखरसं घृतं सखकर्मपटे ।
 कृत्वा धूमं पिबेच्छुद्धं वाष्पं वा खातुं वा गवाम् ॥
 श्लोवाकवहमानानां नाडीं शुष्कां कुण्मा वा ।

Caraka Saṁhitā, VI. xxi.

end into his mouth for inhalation. The lower pot contains glowing charcoal of catechu (*Aecacia catechu*, Linn.) wood, over which are put pills of necessary medicines. The tube is from eight to ten *aṅguli* long.¹ This inhaler is intended for phthisical subjects. It is useful for allaying cough and exciting emesis. This instrument is called *mallaka sampuṭa* or *śorūba sampuṭa* or a pair of earthen basins. In such an apparatus Caraka recommends us to put powders of cow's horn, hairs, nerves and ligaments, besides other medicines. *Susruta*², *Vāgbhaṭa*³ and *Cakradatta*⁴ also describe it. *Śārṅgadharma*⁵ however reserves this instrument for fumigating wounds only.

The length of the pipe will vary according to the different kinds of smoking prescribed by the physician. There are five kinds of smoking narrated :—

1. *Śamana*, *madhya*, *proyogika* — medium.
2. *Brīṃhana*, *snehaṇa*, *mṛda* — mild.

¹ दशाङ्गुलीमितां नाडीं अथवाष्टाङ्गुलीमिताम् ।
शरावसंपुटच्छिद्रे कृत्वा जिह्वां विचक्षणः ॥
धैरेचनं सुखेनैव कामवान् धूममापिबेत् ॥

Caraka Saṃhitā, VI. xxii.

² इतरद्योर्व्यपेत धूमोद्धार स्थिरे समाहिते शरावे प्रविष्ट्य वन्ति मूलच्छिद्रेणान्येन शरावेण
पिपाय तस्मिन्च्छिद्रे नेत्रमूलं संयोज्य धूममासेवेत् ।

Susruta Saṃhitā, IV. xi.

³ शराव सम्पुटच्छिद्रे नाडीं न्यस्य दशाङ्गुली ।
अष्टाङ्गुली वा वक्ष्येण कामवान् धूममापिबेत् ॥

Astāṅga Hṛdaya Saṃhitā I. xxi.

⁴ अथवा सघृतान् शक्नुन् कृत्वा मल्लिकासम्पुटे ।
नवप्रतिश्यायवतां धूमं वैद्यः प्रयोञ्जयेत् ॥

Cakradatta, Nāśaroga Cikitsā,

¹ See foot-note 2. P. 145.

- | | |
|----------------------------|---------------|
| 3. Recana, śodhana, tikṣṇa | — strong. |
| 4. Kāsaghna | — anti-cough. |
| 5. Vāmana | — emetic. |

So the length of the tube would vary thus—

1. Caraka¹

				Āṅguli.
In strong smoking	...	...	...	24
" medium "	...	...	...	32
" mild "	...	...	...	96

2. Suśruta.²

In medium smoking	...	...	...	48
" oleaginous "	...	...	...	32
" brain-sedative "	...	...	...	24
" anti-cough or emetic "	...	...	...	16

3. Vāgbhaṭa.³

In strong smoking	...	...	...	24
" medium "	...	...	...	32
" mild "	...	...	...	40

4. Śārṅgadharma.⁴

In medium smoking	...	...	...	40
" mild "	...	...	...	32
" strong "	...	...	...	24
" anti-cough "	...	...	...	16
" emetic or wound-fumigation	...	...	...	10

FUMIGATION.

Similarly wounds are said to be purified by suitable medicinal fumigation. In the purification of wounds by fumigation, we get a glimpse of the antiseptic method of treatment in its

¹ See foot-note 2, P. 140.

² See foot-note 4, P. 140.

³ See foot-note 1, P. 141.

⁴ See foot-note 3, P. 140.

embryonic form. Suśruta¹ recommends the tube to be eight aṅguli long and to have the circumference of a common pea; and its orifice should be of the size of a kulattha (*Dolichos biflorus*, Linn.). The fumes of medicated substances from the inside of any closed pot containing fire, pass out through the tube and are allowed to play on any sore to purify it. For this purpose two earthen pots—*sorāha sampuṭa*—may conveniently be used as before. Śārṅgadharā² uses a tube ten aṅguli long and recommends us to use Nimba leaves (*Azadirachta Indica*) for wound-fumigation. As another instance of the application of the principles of antiseptic methods to practical therapeutics, we may mention the use of medicinal injections into the cavity of the uterus to rectify its morbid conditions.³

A similar instrument was used to fumigate the uterus and vagina in various diseases of these parts. "Fumigation", says Suśruta,⁴ "is to be applied to the vagina by burning the

¹ ब्रणनेवमटाङ्गुलं ब्रणधूपनार्थमकलायपरिमण्डलं कुलत्वादिहसोतइति ।

Suśruta Saṁhitā, IV. xl.

स क्षौमधवसर्पिर्भिधूपनाद्वैद्यधूपयेत् ।

Ibid. IV. l.

² दशाङ्गुलिर्वाग्नीये तथासाद् ब्रणनाडिका ।

कलाय मण्डलस्थला कुलत्वागमरन्धुका ॥१३

* * *

शरावसम्पुटे चित्रा कल्कमद्वारदीपितम् ॥१७

किद्रे नैव निवेश्यैव ब्रणनेनैव धूपयेत् ।

* * *

ब्रणे निम्बवचाद्यैश्च धूपनं संप्रशस्तते ।

Śārṅgadharā Saṁgraha, III. ix.

³ See foot note 2, P. 1318.

⁴ समंसङ्गे तु योषिं धूपयेत् ब्रणसर्पनिर्घोकिण दिव्योतकेनवा ।

Suśruta Saṁhitā, III. x.

slough of a snake (Bungarus) or pinditaka (?) wood, in cases of obstructed delivery of the fœtus. Caraka¹ mentions fumigation of the vagina by burning Bhurjapatra (Betula Bhojpatra), glass, precious stones and the slough of a snake as one of the means for removing the placenta. To remove the after pains and difficulty in micturition and defecation, Suśruta² advises us to fumigate the vagina. He recommends fumigation of the uterus with purifying medicines. In fumigating these parts, the Hindu surgeons desired a local action, and did not share in the belief, held by some of the Greek gynecologists³ that "the uterus was an animal within the body which could wander about, being attracted by pleasant smells and repelled by disagreeable smells".⁴ The Arabs also did not believe uterus to be an animal.⁵ This method of treatment was well known to the Greeks; for Hippocrates⁶ writes that "fumigation with aromatics promotes menstruation and would be useful in many other cases, if it did not occasion heaviness of the head". He "directs us to take a vessel which holds about four gallons and fit a lid to it so that no vapour can escape from it. Pierce a hole in the lid, and into this aperture force a reed about a cubit in length so that the vapour cannot escape along the outside of

¹ मूर्ध्वपश्चाच्चरिषि सर्पनिर्घ्नोक्त्यासा शोषि धूपयेत् ।

Caraka Saṁhitā, IV. viii.

² कटुकालातुक्तवैधन सर्पप सर्पनिर्घ्नोक्त्या कटुकैलविमिश्रैर्वीनिमुख धूपयेत् ।

³ Suśruta Saṁhitā, III. x.

⁴ Aretæus, Morb. Acut. ii. 11.
Plato's Timæus.

⁵ Græco-Roman Surgical Instruments, p. 158.

Adan's Commentary on Paulus Aegineta, Vol. I, Bk. II, p. 636-37.

⁶ See also in the Hippocratic treatises, as Nat. Mul. vii, 9; 1 Morb. Mul. vii, 1; 11 Morb. Mul. xl, 20, 21; Steril. vi, 3; Superfet. ix, 3, x, 9, 11.

the reed. The cover is then fixed on the vessel with clay."¹ Oribasius² and Soranus³ used similar instruments for the purpose.

DISINFECTION OF ROOMS, CLOTHES, etc.

Caraka⁴ says that if peacock's feather, bones of vaka bird, white mustard and red sandal wood, well powdered and mixed with ghee, be used in fumigation, the poison of a room, beddings, seats and clothes, is got rid of. Śārṅgadharma⁵ advises us to disinfect a sick room by the fumes caused by burning the following substances with ghee : peacock's feather, Nim leaves (*Melia Azadirachta*), Vrihati, pepper, asafetida, Jotāmāṁsi (*Nardostachys jotamansi*), seeds of Sālmali (*Bombax malabaricum*), goat's hair, slough of a serpent, cat's faeces and ivory. Suśruta⁶ advises fumigation of a sick room for a surgical patient for

¹ Greco-Roman Surgical Instruments P. 159.

² Coll. xxix.

³ Soranus. xxiii.

⁴ मिश्रिवर्हन्दाकास्त्रीनि सर्पपापन्दने च छतमुक्तः ।

धूमो गृहगयनासनवस्त्रादिषु शस्त्रते विपनुत् ॥१२॥

Caraka Saṁhitā, VI. xxv.

⁵ मयूरपिच्छं निम्बस्य पत्राणि उडतीफलम् ।

मरिचं हिङ्गु मांसौ च बीजं कापामसम्भवम् ॥

हानरोमाहिनिर्मोक्तं बिष्ठा वैकुण्ठिकी तथा ।

मज्जदलस्य तच्चूर्णे किञ्चिद् दत्तं विनिश्चितम् ।

शैलेषु धूपनं दत्तं सर्वान्नालसङ्घातयेत् ।

पिशाचान् राक्षसान्जित्वा सर्वान्वरहरो भवेत् ॥

Śārṅgadharma Saṁgraha, III. ix.

⁶ सर्पपारिप्लवाभ्यो सर्पिषा लवणेन च ।

द्विरन्ध्रं कारयेद्भूपं दशरात्रमवन्दितः ॥

Suśruta Saṁhitā, I. xix.

ten days, morning and evening, after the operation has been performed.*

15. TUBULAR INSTRUMENT FOR CUPPING.

Generally cow's horn is recommended for the purpose. It is eighteen aṅguli long, its base, forming the mouth of the instrument, is three aṅguli wide (Vāgbhaṭa).¹ It is conical in shape and the cone is said to be either curved or straight. The other end is pointed and perforated to the extent of allowing a mustard seed to pass through it. The narrow end, however, is made to assume the shape of a woman's nipple by winding thread round it. This facilitates the operation of suction by the mouth of a surgeon when the broad end is placed against any diseased area of the patient's body. Suśruta² mentions its use in blood-extraction. For extracting blood, the part must be scarified before its application; and to facilitate the operation, the part should be fomented (Yogarātnākara).³ After suction, the horn is to be covered by a piece of cloth or a small bladder of animals.

Vāllūki⁴ describes the śrṅga thus:—"It is the horn of a white cow, half-moon shaped and seven aṅguli broad. The orifice

¹ वाहुलासौ भवेच्छुद्धं चूर्णैः षट्पादमाहुतं ।

अपेक्षितार्थकश्चिद् सुनस्त्वपुकाहति ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² तवप्रच्छिते तनुवस्त्रपटलावलेन ग्रहेण शोणितमवसेचयेदाचूर्णवात् ।

Suśruta Saṁhitā, I. xiii.

³ स्नेहे विदध्याल्लुगलस्य नाद्या ग्रहेण रक्तं बहुशः हरेत् ।

Yogarātnākara Ārbuda cikitsā,

⁴ विषाद्यः क्षेतगोरिन्दूचकं समाहुलायतम् ।

चित्तानः पिपुपैश्चित् योज्य वातयुतेऽसज्जि ।

अङ्गुटे मूलवन्मूले क्षिद्रमयेऽस्मा मुद्रवत् ।

Vāllūki quoted in Nibandha Saṁgraha, I. xiii.

at the base is equal in circumference to that of the base of the thumb, while the end which is perforated admits a moong. This orifice at the end is closed by a wick of cotton". Cakra-pānidatta says that the horn should be three aṅguli long, and its orifice should be of the size of the stalk of an oleander flower.

Suśruta mentions a peculiar use of the horn¹: the extraction of an insect, cerumen, etc. from the middle ear by means of a horn or a probe. The horn was evidently used as an apparatus for suction, and Suśruta describes suction as one of the methods of extracting śalya from the body². Caraka³ uses horns and leeches to extract venom from a snake-bite; and Suśruta also refers to it. Besides the horns and cupping glasses, suction used to be accomplished by the surgeon's mouth.

Similarly Paul⁴ says that foreign bodies may be sucked out from the ears with a reed.

On the method of suction as a mode of treatment, Erichsen⁵ says:—"In former days, when duels with the small swords were of frequent occurrence, persons called "suckers" who were often the drummers of a regiment, were employed to attend the wounded combatants. This treatment which was conducted with a certain degree of mystery, consisted in sucking the wound till all blood ceased to flow, and then applying a pellet of chewed

¹ कर्षन्विद्धे वर्त्तमानं कौडं छेदमलादि वा ।

ग्रह्णेबाधरिद्धीनामद्यथापि शलाकया ।

Suśruta Saṁhitā, VI. xxi.

² See foot-note 3, P. 108.

³ दर्शं वा बुधेन्दुं छेत्तुं यत्रचूर्णं पांशुपूर्णेन ।

प्रच्छन् विधमलीकः ग्रह्णैः स्वायं ततो रक्तम् ॥

Caraka Saṁhitā, VI. xiv.

⁴ Paul. VI. xxiv. and III. xxiii.

⁵ Erichsen's Surgery, Vol. I. p. 341.

paper or a piece of wet linen to the orifice; in this way it would appear that many sword thrusts traversing the limbs were healed in a few days. The process of suction cleared the wound thoroughly of all blood, and drawing the sides into close apposition, placed the parts in the most favourable condition possible for union by primary adhesion. This practice might, perhaps, in many cases advantageously imitated in the present day by means of a cupping glass and syringe".

We also find Suśruta¹ describing a vasti yantra in the treatment of snake-bite. The tube is open at both ends, one end is applied to the part bitten by the snake, while to the other end the surgeon puts his mouth to suck out the poison. So this vasti yantra may be compared to the modern aspiration syringe.

Cupping instruments of metal or horn are still used by the Arabs in Kordofan and Sir R. Pasha² suggests that cupping is possibly borrowed by the west from the "most perfect physicians" the Arab. But now we are confident that the credit is due to the Hindus.

ALĀBU YANTRA.

Alābu or gourd is described to be made of the bark of the succulent fruit called alābu (*Lagenarea Vulgaris*). The pulp is scraped away and the bark is allowed to dry. Such a bark should be selected which is twelve and eighteen aṅguli in length and circumference respectively. Its mouth should be circular and should have a diameter of three or four aṅguli. A fire is to be lit inside it by burning a strip of dry cloth to produce a vacuum, and the

¹ प्रतिपूर्य मुखं वस्त्रेर्हितमाचूषणं भवेत् ।

Suśruta Saṁhitā, V. v.

² Vide Third Report, Wellcome research laboratory at Gordon. P. 316.

instrument to be applied instantly to the intended part of the patient's body. It should be thus used to drain blood and phlegm from the body (Vāgbhaṭa¹). In modern times cupping glasses are used for like purposes in a similar manner.

Vāllūki² describes the alābu yantra thus :—"The mouth of the instrument is well formed and has the diameter of four aṅguli. The body has the circumference of eight aṅguli and is well smeared with a paste of black mud. It is used for drawing out blood". In yogaratnākara³, śrīṅga and alābu are directed to be used for extraction of blood from accidental wounds. Caraka mentions the use of alābu for blood-extraction⁴.

Another instrument known as the ghaṭī yantra was used exactly in the same way⁵. It is said to consist of a brass pot

¹ स्याद्वादशाङ्गुलीऽलावुर्निर्दिष्टा दशाङ्गुलः ।

चतुर्वाङ्गुल इत्तासौ दीनोऽन्यः ये धरकङ्कट् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² यथाङ्गुलपरीणाद्वा चतुरङ्गुलनालसञ्चिता समुखी कृष्णमदालिता तनुः येषां रक्तावसीचनेऽलावुरिति ।

Vāllūki quoted in Nibandha Saṁgraha I. xiii.

सानदीपयाऽलाव्वा ।

Saṁruta Saṁhitā, I. xiii.

³ हिम्ने भिन्ने तथा विह्वे चते मयो भिषगवरः ।

पदसुलेष संस्वेदे ब्रह्म ब्रह्मविशारदः ॥

मुहुर्मुह्यंश्वा दुःखं ना प्राप्नोति ब्रह्मी नरः ।

अथवा दीप्यन्ववणपोटव्या स्नेदयन्मुहुः ॥

मननया ततलोद्गपाधसंयोगतः क्रमात् ।

दृष्टं रक्तं स्मितं चापि गृह्णान्वादिभिर्हरेत् ॥

Quoted in Yogaratnākara.

⁴ रुधिरागमाद्यमथवा गृह्णान्वाभिराहरेत् रक्तम्—

Caraka Saṁhitā, VI. vii.

⁵ तद्वदघटीहिवा गुण्य विषयोन्नमने च सा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

which is still used commonly in India by all classes of people for drinking purposes. A fire should be lit inside as before and the ghaṭī applied to the surface of the body covered by a piece of cloth. It soon becomes firmly fixed and is thus used to raise abdominal tumours by means of it for purposes of correct diagnosis and also to effect its cure by subsidence. It is still used by the common people for the same ends.

Caraka¹ says:—"After the abdominal tumour has been relaxed or softened a little by fomentation and oleaginous application, it is to be covered by a piece of cloth. Then inside a small ghaṭī, a fire is to be lit by burning kuśa and other forms of grasses; the pot is then to be inverted and pressed over the part covered by the cloth. By this way, the tumour would be drawn upwards and be made prominent. The ghaṭī is then to be taken away and after removing the cloth, and examining the extent of the tumour, it is to be incised. The different shapes of the incisions are called vimārga, ajapala and ādarśa. After incision, the tumour is to be pressed and rubbed with fingers. But the intestines and the heart must not be touched."

The extraction of blood by means of cups, has been practised from remote antiquity. It is interesting to note that both the Latin and Greek terms—*cucurbitula* and *σικυα* signify a gourd;

¹ श्लिथस्त्रिद्वजरीराय गुच्छं वैचिह्नमावते ॥
परिवेश्य प्रदीप्तान् वल्लजानयवा कुशान् ।
मिथक् कुम्भे समावाप्य गुच्छं घटमुखं चिपेत् ॥
स गृहीतो यदा गुच्छस्तदा घटमचोदरेत् ।
वस्त्रानरं ततः कृत्वा भिन्नाद्गुच्छप्रमाणवित् ॥

and we know that Alābu also means a gourd. It is curious that the instrument should have been known to the ancient Hindus and Greeks by the same name.

Prosper Alpīnus¹ (16th century) who wrote a book on the state of medicine in Egypt in his time, gives drawings of cupping horns he saw there. The horns were those of young bulls, highly polished, with a small hole at the top, by which the air was extracted by suction. To close the orifice a small tab of parchement was taken into the mouth and affixed by the tongue. The Egyptians also used cupping glasses, by suction and not by fire, a method evidently unknown to them.

Hero of Alexandria (B. C. 285—222) describes an interesting form of cup. Milne summarises his account thus:²—"The figure shows a cup of ordinary flattened form, divided into two by a diaphragm. Two tubes pass through the fundus, one passing through the diaphragm, the other not. Each of the tube is fitted with another which is open at its inner end but closed at its outer end and provided with a small cross bar to rotate it. Each of these sets of tubes is perforated by small openings. In the case of the short tubes, these are outside the cup, in the case of the long tube they are inside the cup, in the chamber shut off by the diaphragm. By rotating the piston these openings can be placed in apposition or not at will, thus forming valves. Open valve A by placing the hole in apposition. Close valve B by turning the holes away from each other. The inner chamber of the cup is now shut off except for the small hole A. Apply the mouth to the valve A, and suck the air out of the chamber. Close valve A. Apply the cup to the affected part. The advantage

¹ *De Med. Aegyptiorum*. Ed. 1541 lib. ii. ch. xii. p. 139.

² *Greeco-Roman Surgical Instruments*. P. 104.

of this arrangement is that the affected part is not directly sucked upon by the mouth; and the instrument is therefore more pleasant for the operator to use".

Celsus¹ thus describes the different kinds of cups:—"There are two kinds of cups, bronze and horn. The bronze is open at one end and closed at the other; the horn, open at one end, as in the previous case, has at the other end, a small foramen. Into the bronze kind, burning lint is placed, and then the mouth is fitted on and pressed until it sticks. The horn is placed empty on the body, and then by that part where the small foramen is, the air is exhausted by the mouth, and the cavity is closed off above with wax and it adheres in the same way as before. Either may advantageously be constructed, not only of these varieties of materials but of another substance. If other things are not to be had, a small cup or a narrow mouthed jar will answer the purpose. When it has fastened on, if the skin has previously been cut with a scalpel, it extracts blood; but if it be entire, air".

Paul² remarks that "those which are made with longer necks and broader bellies are possessed of a strong power of attraction." Both Oribasius³ and Aretaeus⁴ allude to them. Antyllus says that there are three materials of which cups are made—glass, horns, and bronze. A good number of such cups occur in the Naples, British and Scottish National Museums.

¹ Celsus. II. xi.

² Paulus Aegineta. VI. xii.

³ Med. Coll. VII. xvi.

⁴ De Morb. Acut. I. 10.

Albucasis¹ gives a full account of dry cupping. In applying the instrument he advises us either to create a flame in it, or to fill it with hot water. He gives drawings of various instruments of cupping. Rhases speaks of applying a glass or a cupping instrument to draw off blood after leeching. The other Arabians give little additional information.

In modern times, cupping glasses are used in the same way as before.

V. Śalākā or Rods.

The rods, or pricker-like instruments, or probes are described to be of various kinds and are recommended to be used for various purposes²; so their length and circumference would vary according to some special uses required of them. Suśruta³ says : "There are two kinds of śalākā with their ends shaped like the head of the earthworm. They are used for probing abscesses and sinuses.

Two śalākā have their ends shaped like the wing of an arrow. These are to be used for raising any part for the purpose,

¹ Albucasis, Chirrug. II. 198.

² नाडीवृणान् शल्यसमांशुन्मातृत्सङ्गिनः शनैः ।

करीरवालाङ्गुलिभिरिवला वैप्रवेष्टिषक् ।

Suśruta Saṁhitā. IV. 1.

³ शलाकायन्ताख्यपि नाना प्रकाराणि नाना प्रयोजनानि यथायोगपरिणाददीर्घाणि च तेषां मनुष्यदंशरपुङ्गवपेक्षया बहीममुखे ह ह एषण व्युङ्गन्वालाहरणाद्यं सुपदिश्येते । ममूरदल-
मालमुखे ह किञ्चिदानताये कोतोमत्तमल्योद्हरणाय । यद्कापोमकृतोत्थोषाणि प्रमाश्ले-
ष्यन्ति । चीणि दन्वाङ्गुतीनि खड्गमुखानि चारीषधप्रक्षिपणार्थं । शीघ्रानि जाल्वदनानि
वीर्यदुःशयदनानि षड्भाषिकशस्त्रभिषेक्तानि । नामातुदहरणाद्यं मेकं कोलास्त्रदलमात्रमुखं
खड्गतीक्ष्णं । अत्रनाद्यं मेकं कलापरिमण्डलमुभयोः सुकृताय । मूत्रनासोविशोधनार्थ-
मेकं साधतीपुण्ड्रनासप्रमाश्लेषपरिमण्डलमिति ।

Suśruta Saṁhitā, I. vii.

after incision, of extracting any foreign body from it. Others assign to them the function of bringing together the lips of the wound caused by an abscess being opened and emptied.

Two *śalākā* have their ends shaped like the hood of a snake. They are useful for transferring any material from one part to another. Some of the simple probes used by the ancient Greek and Roman surgeons carried a single or double snake of *Æsculapius* at one end. But evidently it was meant as an ornamentation and served no useful purpose.

Two *śalākā* have their ends shaped like a fish-hook but are blunt. They are used for extracting any extraneous material from the muscles or bones².

The last six kinds of *Suśruta* are practically the same as the six *śaṅku* of *Vāgbhaṭa*,¹ which are the following :—

The *śaṅku* are six in number. Amongst these, two are twelve and sixteen *aṅguli* long respectively. They are used for the purpose of raising a foreign body upwards from the wound.

Two varieties have their ends shaped like the hood of a snake. They are ten and twelve *aṅguli* long ; and they are used for the purpose of moving a foreign body in the wound in all directions.

Two varieties have the shape of a fish-hook—the ends resembling the stem of an arrow. These are used for the extraction of foreign bodies from the wound.

¹ मङ्गवः षड्भौ तेषां षोडशदशाङ्गुली ।

अङ्गुलीः द्वि फणावक्रौ द्वौ द्वादश दशाङ्गुली ॥

चालने शरपुत्रा मया बाह्याये वडिमाकृतिः ॥२५॥

Saśruta¹ mentions another pair of śalākā which have their ends shaped like a masūra pulse, and slightly curved; these are used for the purpose of extracting a foreign body from the external outlets of the body such as mouth, nose, etc. They are eight and nine aṅguli long respectively.

SWAB PROBES.

Six śalākā are used for the purpose of wiping out the principal excretory canals of the body *viz.*, rectum, nose and ears.² Their ends are covered with cotton like a head-dress (pāṅḍī). The two śalākā intended for the rectum, have the lengths of ten and twelve aṅguli respectively for short and long distances. So the two varieties of probes for the ears are eight and nine aṅguli long, while the other two kinds of probes for the nose are six and seven aṅguli long respectively. Some commentators are of opinion that these six śalākā are meant for clearing abscesses.

For similar purposes the Greek and Roman surgeons used the spathomele or spatula probe. Priscianus³ writes: "First of all we must frequently wipe away the clots of blood from the nose

¹ See foot note 2, P. 155.

उभेनश्चुपदमुणे स्रोतस्यः शल्यहारिणी ।

मधुरदलवत्ते इ स्याता मष्टनवाङ्गुली ॥२४॥

Aṣṭāṅga Hṛdaya Saṁhitā, I, xxv.

² कापांसं विहितोष्णौषाः शलाकाः यदप्रमार्जने ।

पायावासान् दूरार्थे इ दश वादशाङ्गुली ।

इ यट् सनाङ्गुली घ्राणे इ कर्णेऽष्टनवाङ्गुली ॥२५॥

Ibid.

³ Priscianus, xiv.

with the end of a spathomele wrapped on the 'berry' with soft wool, and then occlude it by plugging with wool in the same way."

The use of probes, having the ends wrapped with wool, for wiping out discharge of pus from the ears of horse, is mentioned by Jayadatta Suri¹ in his Treatment of Horses.

SPOON-SHAPED² PROBES.

Three probes are described to have their ends shaped like a khala or mortar with a conical cavity, and so they resemble a spoon. They are to be used for the purpose of applying caustic solutions, etc.³

Similarly cyathiscomele, which is a variety of spathomele in which the spatula is replaced by a spoon, is said to have been used by the Greek surgeons to mix, measure and apply medicaments. The specimens of these instruments occur in the Naples Museum. Sometimes the edge of the spoon is sharp and is recommended to be used as a curette. Scrivonius Largus directs us to use the spoon of an ear specillum for the application of caustics to hæmorrhoids.

¹ पूयस्त्रावेण जानीयान् शोथमभ्यन्तरोद्भूतम् ।

पितुना वेष्टयित्वा तु शलाकारं समाहितः ॥

तेन कर्णान्तरे पुण्यं कर्षयित्वा विवर्धयः ।

प्रातितस्य मुक्कदस्य पूरयेन्मधुमर्पिषा ॥

Asvamedhyaks, Ch. 34, v. 2. and 3.

² See foot-note 2, P. 155.

NAIL-SHAPED PROBES.

Vāgbhaṭa¹ describes three other probes for the same purpose. They are eight aṅguli long; their ends are bent and resemble in size and shape the nails of the third, fourth, and fifth fingers respectively.

Paul² mentions a nail-shaped probe in the treatment of bubonecele. But this was applied as a cauterity and not for the application of medicaments. Nail-shaped cauterities are also referred to by Hippocrates³ in the treatment of recurrent dislocation of the shoulder-joint.

JĀMVOVAUṢṬHA PROBES.

Three probes are called Jāmvovauṣṭha for their ends are shaped like the fruit of Jambul tree (*Eugenia jambolanum*).⁴ Three other śalākā have their ends shaped like aṅkuṣa or elephant driver's goad.⁵ They may be made of any length required

¹ चटाहला निचमुखा निखः चरीषच क्रमे ।

कनीनी-मध्यमा; नामो-नखमान-सर्पेमुखैः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² Paulus Ægineta, VI. lxx.

³ Hippocrates iii. 15.

⁴ See foot-note 2, P. 155.

शलाका जाम्बवीटानं सरिःश्री च इयक् त्रयं ।

बुध्नात् स्थूलान् द्रौघानो,

[Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

⁵ See foot-note 2, P. 155.

For the diagram of the aṅkuṣa see Fergusson's Tree and Serpent Worship; Plate xxxiii. Sauchi. xxxvii, fig. I. and xxxviii, fig. 1 & 2.

by the surgeon. These six varieties are recommended for the purpose of applying caustic medicaments and the actual cautery.

Paul¹ mentions a gamma-shaped cautery in the radical cure of hernia. This cautery is shaped like the Greek letter Γ ; so it resembles the añkuśa cautery of the Hindus. The añkuśa is similar in appearance to the Greek letter.

One variety, which is used for the purpose of removing a tumour from the interior of the nasal cavity, has its end shaped like a khala or mortar, with sharp edges, and of the size of half the stone of the fruit of the jujube tree (*Ziziphus jujuba*)². Vāgbhata³ mentions a similar probe for the purpose of applying actual cautery to a nasal tumour. Its end resembles in shape and size, a half of the stone of the fruit of the jujube tree.

This spoon-shaped probe of the Hindus is comparable to the curette like sharp cyathiscoemele of the Greeks, noted before.

COLLYRIUM PROBES.

For the purpose of applying collyria to the eyes, a rod is mentioned having the length of eight añguli and the thickness of a pea. Its both ends are shaped like buds⁴.

The probes for applying collyria to the eyelids, should be six añguli long, with a rounded bulbous end. They may be made of gold, or silver, or copper, or iron, or stone. For the habitual use of collyria, a lead probe is prescribed. When medicines are directed

¹ Paul, VI, lxii.

² See foot-note 2, P. 155.

³ कीलास्त्रि दल तुल्या सा नामार्जो, बृहद दाहकम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I, xxv.

⁴ See foot-note 2, P. 155.

to be applied not only to the lids but also to the conjunctiva, the finger is recommended as it is a softer and safer instrument. Again the probes would vary according to the nature of the collyria to be used. As for the application of lekhana collyrium, the probe should be made of copper and should be ten aṅguli long. The probe is advised to be made thinner at its middle to afford a firm grasp by the surgeon. The ends are shaped like buds. For applying ropāṇa collyrium, a similar probe is to be used, but it should be made of steel; while for the application of a collyrium for the improvement of the visual strength, a probe made of gold or silver, and having the size and shape of a finger is recommended by Cakradatta.¹

Suśruta² likes a probe of steel, or bell-metal, or copper for lekhana collyrium; and of gold, or silver, or horn, for ropāṇa and snehana collyria. The probe should be eight aṅguli long, and the eye is to be kept open and fixed by the left hand, while the right hand is to hold the probe, and so the collyrium is to be applied to the eye.

¹ दशाङ्गुला तनुर्मध्ये शलाका मुकुलानना ॥

प्रयक्ता लिखने ताम्बी रोपणे काललोहजा ।

चङ्कलीव सुवर्णोत्था रुप्यजा च प्रसादने ॥

Cakradatta. Ācchyotana Cikitsā.

² तेषां तुल्यगुणान्वेष विदध्याद् भाजनान्यपि ।

सौवर्णे राजते शाङ्गेनाभं वैदूर्यकास्त्रजं ॥

आयसानि च योज्यानि शलाकाश्च यथाक्रमं ।

वक्रयोर्मुकुलाकारा कलाय परिमण्डला ॥

षष्ठाङ्गुला तनुर्मध्ये मुक्तता साधुनिष्ठा ।

चौडम्बव्यग्मजातानि शारीरी वा हिता भवेत् ॥

Suśruta Saṁhitā. VI. xviii.

Śārṅgadharā¹ says: "The collyrium probe should be made of stone or metal. It should be eight aṅguli long and its ends must be made smooth and rounded like a common pea. For lekhaṇa collyrium, a copper, or iron, or stone probe is to be used, while for ropana collyrium the tip of the finger is recommended for its softness."

Of the probes used by the Hindus for applying collyrium to the eyes, fortunately we possess a few specimens. Among the objects of interest found in the excavations at Bijnor, we find, "fourthly, one copper salai or instrument for applying antimony to the eye, similar to those found in the Bihar excavations."²

¹ मुखयोः कुण्डिता श्रृङ्गा शलाकाश्चाङ्गुलीभिः ।

अग्रजं धातुना वा स्वात् कलापपरिमण्डला ॥

तामलोद्धारसंज्ञाता शलाका लेखने सता ।

सुवर्णरजतौडता शलाका रोहने सता ।

अङ्गुली च सट्टलेन कथिता रोपणे बुधे ॥

Śārṅgadharā Saṅgraha. III. xiii.

Yogaratanākara. Eye Diseases. P. 823.

विफलं सलिलयोनिं सङ्गराजद्वये च

इविधिं च विषकल्मे जीरे शस्त्रे मधुरे ।

प्रतिदिनमथ तत्र सतथा मौसमेकं

प्रणिहितमथ पत्रात् कारयेत् तच्छलाकाम् ॥

सचितुषदयकानि साधना व्यञ्जना वा

करकरिकसमेतान्ध्रपैक्षिण्यरोगान् ।

असितमितं समुत्थानं सन्धिवर्माभिर्जातान्

हरति नयनरोगान् सेव्यमाना शलाका ।

Cakradatta, Netraroga Cikitsā.

² "Vide Prinsep's (Thomson's) Indian Antiquities, fig. 18, pl. iv" J.A.S.B. IX. 1. 7.

Specillum with two olivary ends formed a variety of probe of the Greek and Roman surgeons. It was used as an ordinary probe in dealing with crooked fistule, and as a cautery to destroy the roots of hairs after epilation. Sometimes it carried an eye in one of its olives and was used in the treatment of nasal polypus. The eye was threaded with a cord having many knots along it. The other end of the probe was pushed through the nose and withdrawn by the mouth, and then by a sawing movement of the cord with both hands of the surgeon, the polypus was removed.¹ A single probe for the application of semi-solid medicaments, occurs in the outfit of the oculist of Rheims, in the museum at St. Germain-en-Laye and is figured by Milne.²

KARṆA-ŚODHANA OR EAR-CLEANER.

This śalākā is said to have its end shaped like the end of a leaf of Aśvattha (*Ficus religiosa*). The instrument looked like a *sruva*—one of the famous spoons used in sacrificial ceremony.³ It was used for the purpose of extracting wax from the ears.

The different kinds of spoons used in the ancient Hindu ceremonies were as follows: "Three different *sruk* or offering-spoons are used *viz.*, the *guhā*, *upabhrīt* and *drubha*. They are made each of a different kind of wood, of an arm's length (or according to others, a cubit long) with a bowl of the shape and size of the hand, and a hole cut through the bark and front

¹ Paul VI, lxxxvii, VI, xiv, VI, xxv.

² Green-Roman Surgical Instruments, pl. xi, fig. 5.

³ कर्णशोधनं मन्त्रस्य यत्नं प्राज्ञं सुदाननं ॥

side of the bowl and fitted with a spout, some eight or nine inches long and shaped like a goose's bill. The *sruva* or dipping-spoon, on the other hand, chiefly used for ladling the clarified butter (or milk) from the butter vessel into the offering-spoons, is of the *khadira* wood (*Accacia catechu*), a cubit long, with a round bowl measuring a thumb's joint across and without a spout".¹

So we see that the bowl of the *karna-śodhana* was round in shape.

Suśruta also mentions a *śalākā* for the extraction of cerumen or minute insects from the ears.² Cakrapāṇi³ alludes to it. In modern times, the ear-cleaner, as used commonly in India, is a *tāla yantra*. Ear specillum is frequently mentioned by the Greeks and Romans. It consisted of a small narrow scoop at one end and a simple probe at the other. The use of the scoop is thus described by Archigenes⁴: "If a bean, stone, etc. fall into the ear, remove it with the small narrow scoop of the ear specillum". Celsus⁵ directs us to extract a scab or cerumen by means of the ear specillum.

The ear scoop used by the modern surgeons is a narrow scoop, more like the Hindu *pujā* vessel known as *kuśī*. The ear scoop is often made in combination with a director.

¹ Śatapatha Brāhmaṇa, Sacred Books of the East. I. 3. 1. 1. foot-note.

² See foot note 1, P. 140

³ छेदयित्वा तु तैलेन स्वेदेन प्रविशाम्य च ।

शोधयन् कर्णगूदं मिथक् सम्यक् शलाकया ॥

Cakradatta, Karpāroga.

⁴ Galen. XII, 652.

⁵ Celsus. VI. viii.

GARBHA-ŚAŪKU. FŒTUS OR TRACTION HOOK.

The end of this instrument is said to have been bent like aṅkuśa or elephant driver's goad. It is described to have the same length as the other śaūku have *i. e.* ten to sixteen aṅguli, and it is eight aṅguli in width.¹ It is recommended for extracting a dead fœtus from the mother's womb, after perforating its head by the maṇḍalāgra or mudrikā knife. Suśruta recommends us to perforate the head and then to extract the bones by the śaūku or hook, and lastly to apply traction by fixing it about the chest or axilla. If the head can not be perforated, it is to be applied to the eyes or cheeks.²

Traction hook for extraction of a dead fœtus was well known to the ancients. Hippocrates³ bids us break up the head of the fœtus with a cephalotribe and remove the bones with bone forceps, or deliver it by a traction hook inserted near the clavicle. Celsus⁴ advises us to insert a smooth hook with a short point and to fix it in the eye, or the ear, or the mouth, or the forehead, and so the fœtus is to be dragged down. Soranus points out the best places for the insertion of the hook to be the eyes, the occiput, the mouth, the clavicles, and the

¹ नतोऽपि शङ्कुना तुल्यो गर्भे शङ्कुरितिक्रुतः ।

अष्टाङ्गुला यतस्तेन मूढगर्भे हरितुं श्रियाः ॥ १६ ।

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

² नतं स्त्रियमाश्रयं मण्डलाग्रेणाङ्गुलीशस्त्रेण वा शिरोविदाप्य' शिरःकपालान्वाह्यं शङ्कुना मण्डोत्थोरसि कक्षायां वापहरेदभिद्रे शिरसि चाचिकृटे गन्धे वा ।

Suśruta Saṁhitā. IV. xv.

³ Hippocrates. II. 70.

⁴ Celsus. VII. xxix.

ribs in head presentations; and the pubes, ribs, and clavicles in footling cases.¹ Soranus, Aetius² and Paul³ direct us to extract the foetus in the same way but they recommend us to use two hooks instead of one, in order that the pulling may be straight down and not to one side.

Albucasis,⁴ Rhases,⁵ Haly Abbas,⁶ and Avicenna⁷ give similar directions for opening the child's head and for delivering the foetus with hooks.

This purpose in modern times is served by the blunt hook and crotchet.

YUJSA-SANKU OF MIDWIFERY FORCEPS.

An instrument is thus named and figured by modern writers on Hindu surgery, bearing some resemblance to the modern forceps, for extracting the child alive. We have, however, no mention of any such instrument in the works of Caraka, Suśruta Vāgbhata and other ancient authorities. The Greeks and Romans were also ignorant of it; and the Arabians fared no better, though Adams, in his commentary on Paul⁸ asserts that Avicenna refers to forceps for the delivery of living children. Mulder, in his valuable work,⁹ gives an extract from a translation from the works of Avicenna supporting

¹ Soranus. II. xlix.

² Aetius. IV. iv. 23.

³ Paul. VI. lxxix.

⁴ Albucasis. Chirrag. II. 76 and 77.

⁵ Rhases. Cont. xxii.

⁶ Haly Abbas. Pract. ix. 57.

⁷ Avicenna. lib. 21, l. 24.

⁸ Puffus. Aegineta. III. lxxvi.

⁹ Historth Forceipum et Vecticum. p. 6.

the same conclusion. Smellie¹ says : "With regard to the fillets and forceps, they have been alleged to be late inventions ; yet we find Avicenna recommending the use of both. The forceps recommended by Avicenna is plainly intended to save the foetus". "He recommends all the old methods for assisting in natural labours ; and if the woman can not be delivered by these, he orders a fillet to be fixed over the head : if that can not be done, to extract with the *forceps* ; and should these fail, to open the skull ; by which means the contents will be evacuated, the head diminished, and the foetus easily delivered."² Playfair³ also holds the same view. The point is however by no means settled. For Milne⁴ says : "A full consideration of Avicenna's words seems to me to lead to the conclusion that he is describing no more than extraction with a craniotomy forceps. If the forceps fail, the child is to be extracted by incision, as in the case of a foetus already dead (and decomposed so that the forceps would not hold)."

Thus we may be sure that there is no available evidence of the use of delivery forceps by the Hindus, Greeks, Romans and Arabs ; and the Chamberlens are still the undisputed claimants to the glory of the invention.

But there is no doubt that the Hindu surgeons tried extraction of the living foetus by manual traction. The hands are recommended to be well oiled and introduced into the uterus. If the child be dead, sharp instruments are advised to be intro-

¹ Smellie, *Treatise on Midwifery*, p. 40.

² *Ibid.* Edited by McClintock. New Syd. Soc, vol. I. Introduction p. 50.

³ *Researches on Operative Midwifery*, p. 10.

⁴ *Cræo-Romana Surgical Instruments*, p. 156.



duced into the vagina for cutting upon the fetus. But on no account such instruments are to be used so long as the child is alive.¹

SARPA-PANĀ OR SNAKE'S HOOD.

It is also called *agra-bakra* i. e. the end bent. It is a *śaṅku* or hook similar to the above, the end being bent like the hood of a snake.² It is to be used for the purpose of extracting stone after operation.

Sn̄ruta, in the operation for extraction of stone through the perineal incision, directs us to use the *agra-bakra* to bring the entire stone out of the wound. But in the case of females, he recommends us to use a knife having a spoon like a scoop, to prevent the formation of a vesicico-vaginal fistula.³ Is it a spoon-shaped knife, or is it a double instrument on a handle—a knife at one end and a scoop at the other? The Greeks used a knife having a scoop at the end.

१ गर्भे जीवति मृदे तु गर्भं दधे न निर्हरेत् ।
 हृद्येन सर्पिषाक्षेन योनेरन्तर्यतेन सा ॥
 सते तु गर्भे गर्भिण्या योनीं शस्त्रं प्रवेशयेत् ।
 शस्त्रशाल्वाध्विविदूषी लघुहस्ता भयोजिह्वता ।
 सचेतनं तु शस्त्रेण न कथञ्चन दारयेत् ॥

Yogaratanākara, Muṣḍhagarva Cikitsā.

२ अग्रमथोद्धरणं सर्पफणावदकं कथतः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

३ यथा च न मिथ्येन न चूर्णं ते वा तथा प्रयतेत चूर्णमल्पमप्यवस्थितं हि पुनः परिहृयिष्येति तस्मात् समसामयवज्ज्ञेनाददीत । स्त्रीशालु कतिपार्श्वगतो गर्भाशयः सन्निकटः तस्मादा सामुत्सङ्गवच्छस्त्रं पातयेदतोऽन्वया खज्जामां सूचसाधौ ब्रह्मो भवेत् ।

Sn̄ruta, Saṁhitā, IV. vii.

Celsus¹ describes the extraction of stone through a perineal section by means of the lithotomy scoop. "The scoop is slender at the end and flattened out in the shape of a semi-circle, smooth externally where it comes in contact with the tissue, rough internally where it meets the calculus". It was a long hook-like instrument.

Aetius² mentions a special stone extractor, under the treatment of calculus in the female. Some understand by it the lithotomy forceps.

In modern times we use the lithotomy forceps and scoop for the same purpose.

I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows: "I will not cut persons labouring under the stone, but will have this to be done by men who are practitioners of this art". This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation. "M. Littré finds some difficulty in accounting for the circumstance that the novice in surgery is interdicted from the operation of lithotomy." Adams,³ commenting on the sentence, says: "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physician, Avenzoar⁴, who "pronounces the operation to be one, which no respectable physician would witness, and far less to perform."

¹ Celsus. vii. xxvii.

² Aetius. IV. iv. 94.

³ The Genuine Works of Hippocrates. Vol. II. P. 777—8.

⁴ Avenzoar. II. 2, 7.

The explanation that this was proscribed because there were men who devoted themselves exclusively to this kind of treatment, and that if the qualified surgeons be allowed to practise the operation, they would interfere in the sphere of action of the lay lithotomists, cannot be considered satisfactory. For the question still remains the open one, why should Hippocrates proscribe this operation from the domains of scientific surgery, simply because a few laymen happened to practise it.

The real explanation is that in Hippocrates' time success in the operation was very difficult to achieve, consequently he interdicted the operation much in the same way as abdominal operations were considered sacred before the days of antiseptic surgery. It is curious to find that Suśruta calls this operation the worst of all surgical operations, for he says¹: "Even experienced and able surgeons fail to attain success by operation for the stone. So the surgical treatment is the worst of all treatment here. But if you do not operate, the patient will die; and it is doubtful whether he will live after the operation; so give him the chance of operation in God's name." I do not know whether this passage of Suśruta has any causal relation to the remarks of Hippocrates, but there is no doubt that the former serves as a better commentary on the latter, than anything hitherto suggested.

Adams² says that this operation was practised by a class of men,

¹ कुशलान्वापि वैद्यस्य यतः निहिरिद्वाधु वा ।

उपक्रमो ज्ञेयश्चोऽयमतः स परिकीर्तितः ॥

अक्रियायां प्रवृत्तौ मृत्युः क्रियायां संशयो भवेत् ।

तच्चादावृक्का कर्तव्यमनीश्वरं साधुकारिणा ॥

Suśruta Saṁhitā, IV. vii.

² Commentary on Paulus Aegineta, Vol. II. P. 303.

separate from the surgeons, in all countries in ancient times, and points out that the ancient operation of lithotomy is still practised with great success by the native doctors of Hindusthan. No conclusion is, however, to be drawn from the modern practices in India, as we find separate classes of men not only for stone, but also for bone-setting, cataract, etc. And whatever may be the practice in modern times, we find that during Suśruta's time, the operation was not the privilege of the laymen.

ŚARAPUṆKHA-MUKHA PROBE.

This instrument is also described to have its end bent like the hood of a snake. It is four aṅguli long and is recommended to be used for the purpose of extracting a tooth from its socket.¹

Tooth elevator or instrument for levering teeth is mentioned by Galen.² It is of the same size as the bone lever which, according to Paul,³ is seven or eight aṅguli long.

This instrument resembles in shape and action the tooth elevator of the modern surgeons.

ARDHACANDRA-MUKHA ŚALĀ. HALF-MOON PROBE.

The first half of this variety of śalā is curved like a half-moon, to which is attached the second half as a rounded handle.⁴ Suśruta advises us to use it for the purpose of applying actual

¹ शरपुङ्खमुखं दन्तपातनं चतुरङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

² Galen. xviii, 593.

³ Paulus Ægineta. VI. cvi.

⁴ शलाकामन्त्रवन्मूनि ।

मन्त्रोऽहं दन्तपातनं मूनि चतुरङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

cautery to the groin in bubonecele, to prevent the hernia from entering into the scrotum.¹

A crescent-shaped cautery was also used by the Greek and Roman surgeons. So Paul² says that in cases of sloughing of the præpuce we must cut it off and use lunated cauterics to stop hæmorrhage and prevent the spreading of the wound. Again he mentions a cautery shaped like the Greek letter Γ, in the radical cure of hernia.³

BONE LEVER.

Instruments for levering fractured bones into their proper positions are mentioned several times by Suśruta. In the treatment of fracture of the nasal bones, a śālākā is recommended to be used as a bone lever for raising and depressing the fractured ends.⁴ Sometime a muṣala or pestle is advised to be used.⁵ It is a thick wooden pestle the end of which is plaited with iron. It is still used to strike upon paddy to separate the husk from the rice. Suśruta mentions its use to reduce dislocations of the joints of the shoulder and neck.⁶

¹ तत्र या वङ्गस्थिता ताः दहेदहन्दुवकया ।

सप्तस्र्गानां वरोधाय कोशप्रानां तु वर्जयेत् ॥

Suśruta Saṁhitā, IV. xix.

² Paulus Ægineta. VI. lvii.

³ Ibid. VI. lxii.

⁴ नासां स्रग्नां विवृतां वा कर्त्र्यौ कृत्वा शलाकया ।

Suśruta Saṁhitā, IV. iii.

⁵ सप्तस्र्गमयेत् श्लिष्टमवकम् मृदलेण तु ।

तथोन्नतं दोहयेत् वप्रीयाद्वाद्मेव च ॥

Ibid.

⁶ तैलपूर्णं कटाक्षे वा डोण्यां वा शयवेद्धरं ॥

मृद्वेनोत्थिपेत् कचामांसमन्वी विमृहते ।

स्थानास्थितश्च वध्नीत स्तम्भिकेन विचक्षणः ॥

Ibid.

The pestle was also used by Hippocrates¹ to reduce dislocation of the shoulder joint. He says: "Those who accomplish the reduction forcibly bending it round a pestle, operate in a manner which is natural. But the pestle should be wrapped in a soft shawl (for thus it will be less slippery), and it should be forced between the ribs and the head of the humerus. And if the pestle be short, the patient should be seated upon something, so that his arm can with difficulty pass above the pestle. But for the most part the pestle should be longer, so that the patient when standing may be almost suspended upon the piece of wood. And then the arm and forearm should be stretched along the pestle, whilst some person secures the opposite side of the body by throwing his arms round the neck, near the clavicle"

The bone lever used by the Greeks is thus described by Paul:² "It is an instrument of steel about seven or eight fingers' breadth in length, of moderate thickness that it may not bend during the operation, with its extremity sharp, broad and somewhat curved."

DIRECTOR.

Suśruta³ mentions the use of eṣaṇī or metallic probes not only to ascertain the course of the fistulous track but also to raise the bridge of skin covering the sinuses, so that the surgeon may operate on it as a guide. Cakradatta⁴ also uses a probe to

¹ The Genuine Works of Hippocrates. Adams' Trans. p. 372.

² Paulus Aegineta, Vi. cvi.

³ पञ्चेषु चोपस्थिभ्रमवगाहस्तिष्ठं शय्यायां सन्निवेश्यार्थमस्मिन् दन्तयित्वा भगन्दं सनीचां परावीरमवाचीनं वा बहिर्मुखमनन्तर्मुखं वा ततः प्रणिधायैषणीमुग्रस्य साशयमुदरेच्छन्नेन
Suśruta Saṁhitā, IV. viii.

⁴ नाडीनां गतिमन्विष्य शस्त्रेनापाश्व्य कर्म्मवित्।

Cakradatta, Nāḍivraṇa Cikitsā.

learn the direction of the wound before operation. It is also mentioned in the *Yogarātnākara*.¹

In the treatment of fistule, Celsus² also says: "A director being inserted into them down to their termination, the skin ought to be incised." It is not mentioned that the *eṣaṇī* or probe was grooved, but there is no doubt of its use like a grooved director, so common nowadays. The discovery of such a director, along with several other surgical instruments, which are preserved in the *Musée de Cinquantenaire*, Brussels, proves that it was known to the Romans.

URETHRAL PROBE.

A variety of *śalākā* is described by *Suśruta* ³ to have its end rounded like the stalk of a *mālatī* flower (*Echites caryophyllata*, Rox.) It is to be used for cleaning the urethral canal.

*Caraka*⁴ mentions a probe for examining the direction of the urethral canal and its pathological condition, before introducing the tube of the urethral or bladder clysters into it.

¹ नाडीनां गतिमन्वीत्य शक्ते शीतपात्र्य कर्मवित् ।

Yogarātnākara, p. 346.

² Celsus, VII. iv.

Græco-Roman Surgical Instruments, p. 73.

³ मूलमार्गविशोधनायै एकं मालतीपुष्पशलाकप्रमाणं परिच्छलमिति ।

Suśruta Saṁhitā, I. vii.

⁴ कर्जोः मुखोपविष्टस्य हटे मेट्टं हृतान्विते ।

शलाकवान्वित्य गतिं यद्यप्रतिहतां प्रजित् ॥

ततः शिफःप्रमाणेन पुष्पनेत्रं प्रविश्येत् ॥

Caraka Saṁhitā, VIII. ix.

Class VI. The Upayantra or Accessory Instruments.

The sixth class of the blunt instruments comprises the upayantra or accessory instruments. By surgical instruments, the Hindus consider not only the instruments proper, but also any mechanical aid by which the object of the surgical treatment is attained. Thus even medicinal agents are considered under this head for they help the inflammatory swellings to subside, or suppurate, or burst open as by various external applications. The accessory instruments are :

1. RAJU OR THREAD.

As an example of thread being used as an instrument of surgery, we know that the thread smeared with caustics are recommended by Suśruta¹—kṣāra sūtra or caustic thread—for the operation of fistula-in-ano. For further informations on the subject see “Esaṇī or sharp probes” under the Śastra.

Thread as a material of phalayartī or tent is mentioned by Śārāṅgadharma.² If after a vaginal or intra-uterine douche, the injection does not flow out, he advises us to introduce a strong tent made of thread, dipped in oleaginous medicines of the

¹ ऊशदुर्जलमौकशां नाङ्गौमर्शयिताव या ।

चारमूलेन क्षिप्रान्नतु शस्त्रेण बुद्धिमान् ॥

Suśruta Saṁhitā, IV, xvii.

Cakradatta, Nāḍīvraja Cikitsā

² फलवर्ति निदध्याहो योनिमार्गे दृढं भिषक् ।

मूलेर्दिनर्मितां सिन्धुं शोधनद्रव्यघंयुताम् ॥

Śārāṅgadharma Saṁgraha, III, vii

sodhana (Purifier) group. Cakradatta¹ uses caustic threads in the treatment of piles by ligature.

2. VENIKĀ OR TWINE.

The use of twine as a ligature to be applied above the part bitten by a snake to arrest the circulation of blood towards the heart is mentioned by Suśruta.² Caraka³ also advises us to tie ligatures above and below the bitten part, then to squeeze out the poison towards the wound, whence it is to be drawn out through incisions made by a knife.

3. PAṬṬA OR BANDAGES.

For the proper application of bandages, Suśruta mentions the following materials to be necessary :⁴ *viz.*, cloth manufactured

¹ भावितं रज्ज्वनीयैः खट्वीचौरं पुनःपुनः ।

वन्धनात् सुदृढं मृतं भिनत्ताग्रे भगन्दरं ॥

Cakradatta, Arisaroga Cikitsā.

² सा तु रज्जादिभिर्वह्ना विषप्रतिकरीमता ।

Suśruta Saṁhitā, V. v.

³ दंशत् तु विषं दृष्ट्वा विस्तृतं वेणिकां भिषक् बद्धा ।

निष्पीडयेद्दन्तं दंशमुद्धरेन्मृच्छं वज्रम् ॥

Caraka Saṁhitā, VI. xxv.

⁴ अत ऊर्ध्वं जगत्तन्मन इत्याद्युपदेवामः । तद्यथा चौमकापांसविकटुकल कौशेय पर्चोणं चीनपट्टवस्त्रालव्यस्त्रालाकावृगकललता विदलरज्जुतूलफलसनानिका कौशनीति तेषां व्याधि कार्त्तं चाविचोपयोगः प्रकरणतर्पणमादिशः । तत्र कौशदामस्तिकानूर्वेक्षितप्रतोली-मण्डलस्थगिकायमकखट्वाचीनविवस्त्रवितानगोफणाः पञ्चाङ्गी चेति अनुद्गमवस्त्रविशेषाः ।

तेषां नामभिरेवाङ्गत्तवः प्रायेणव्याख्याताः । तत्रकौशमण्डुहाडुलिपर्वसु विदध्यात् । दाम सम्बाधेऽङ्ग । सम्बिह्वलकभूतानानरतलकर्णेषु स्मृतिर्कं । अनुर्वेक्षितानु शास्त्रानु, । चौशमेद्वयोः प्रतोली । इत्येङ्गे मण्डलं । खट्वाडुलिमेद्वयेषु स्थमिका । यमलवणयो र्यमकं । जगत्तवगणेषु खट्वा । अपाङ्गयोचीनं । पृष्ठदरीरःसु विवस्त्रं । सूत्रेणि वितानं चिदुक्तमासीत् सवस्त्रेषु गोफणा । जगत्तव ऊर्ध्वं पञ्चाङ्गीमिति । यो वा यस्मिन् शरीर प्रदेशे सुविचिह्नी भवति तं तस्मिन् विदध्यात् ।

Suśruta Saṁhitā, I. xviii.

from the fibres of plants, flax, cotton, wool, blankets, silk, leather, Chinese cloth, inner barks of trees, bark of bottle gourd (*Cucurbita lagenaria*), tendrils of twining plants, cane or pieces of split bamboo, rope, fruits as those of *Bombax Malabaricum*, blades of knives, and plates of metals as gold, or lead, or iron. These articles should be used with due consideration as regards the nature of the disease, the time of their use and the purpose in hand. He describes fourteen varieties of bandages as follows:—

1. *Kośa* :— a hollow cylinder or sheath to be applied to the joints of the thumb and fingers. This form of bandage is to be applied over the stumps after amputation of the limbs.

2. *Dāma* (*i.e.* tail of a quadruped ?) :— it is a large bandage to be tied round a part for the relief of pain or cramps.

3. *Svastica* or a circular cross-bandage :— it is to be applied round the joints, the space between the tendons of the great and second toes, the intermammary region, the glabella (space between the eyebrows), the plantar surfaces of the feet, the palmer surfaces of the hands, and the ears. It is also the form of bandage recommended in dislocations of the shoulder joint.

4. *Anuvellita* or an encircling bandage :—it is to be applied to the limbs. This form of bandage is recommended to be applied to the limbs in cases of oblique, deep, and large cuts inflicted by a knife. A leather bandage applied in the form of *gophaṇā* would also serve the purpose. The encircling bandage is also advised in cases of fracture of the ribs.

5. *Protoli* :— a broad bandage for the neck and penis.

6. *Maṇḍala* or a circular bandage :— it is to be applied to

the round parts of the body such as the arms, sides, abdomen, thighs, and back.

7. *Sthagikā* or a supporter:— a bandage enclosing a splint and pastes of medicaments to keep the parts firm. It is to be applied over the ends of the thumb, fingers, and penis. *Suśruta* directs us to use this bandage round the scrotum after tapping the hydrocele.

8. *Yamaka* or a double-bandage:— a pair of circular bandages applied to a couple of ulcers on a part.

9. *Khatvā* or a four-tailed bandage:— it is recommended for the temples, cheeks and lower jaw.

10. *Chīna* or a banner bandage:— a bandage for the inner angles of the eyes.

11. *Vivandhana* or a circular chest-bandage:— it is the bandage for the back, abdomen and chest.

12. *Vitāna* or a canopy bandage:— a large bandage for the head.

13. *Gophaṇā*¹ (*lit.* a sling for throwing stones):— a concave bandage for the chin, nose, lips, shoulders and pelvis.

¹ शास्त्रासु प्रतितां सिध्यिक् प्रहारान्विहतान् भृशं ।

सौख्येत् समग्रिवेष्टासु सम्यक्सीन्यनुपूर्वशः ॥

वडा द्विजितकेनाय ततस्तैलेन सेचयेत् ।

चर्मणा योफणावन्धः कार्यो यो वा हितो भवेत् ॥

Suśruta Saṁhitā, IV. ii.

पादौ निरस्तमुग्रस्य जलेन पोषा चाक्षिणी ।

प्रवेश्य तुग्रसेवन्वा मुक्तौ सौवेततः परं ॥

कार्यौ योफणावन्धः कण्ठ्यामावेश्य यन्मकं ॥

14. *Pañcāṅgī* or a five-tailed bandage¹:— it is intended for the parts above the clavicle, as in the dislocations of the lower jaw. *Caraka*² mentions a bandage called *kavalikā*, to be tied tightly after setting a fracture or reducing a dislocation. It is so-called from the medicinal paste which is applied to the affected parts, underneath the splints.

Dunghlison mentions a bandage called *Accipitar* to be applied over the nose. It is so called from its likeness to the claws of a hawk. It resembles the *pañcāṅgī* bandage of the Hindus.

So the bandages are recommended to vary according to the different parts of the body; and the surgeon, using his discretion, is to select the form of bandage suitable to the part. The bandages are recommended to be firmly secured to their place by three strings, applied upwards, downwards and obliquely. The knot is avoided over the seat of ulcer and tied on a side.

Suśruta says: "Bandages are applied with three degrees of tightness according to the seat of the abscess:—
1. A tight bandage causes uneasiness but not actual pain;
2. A loose bandage is loose and relaxed;
3. An even bandage is properly applied—neither tight nor loose.
The tight bandage is to be applied to the buttocks, sides of the abdomen, axilla, groin, chest and head. The eyes and joints

¹ इन्वस्त्रिणौ समानौव इनुसन्तौ विमंडते ।

स्नेदयित्वा स्थिते सप्यक् पञ्चाङ्गी वितरेद्विषक् ॥

Suśruta Saṁhitā, IV, iii.

² 'अस्त्रिभग्न' च्युतं सन्धिं संदधौत समं पुनः ।

समेन सममङ्गेन कृत्वा न्येन विचक्षणः ॥

स्त्रिः कवलिकावस्त्रैः कुशिकाभिश्च संस्थितम् ।

पटैः प्रभूत सर्पिर्कैर्वप्रीयादवलं मुखं ॥

Caraka Saṁhitā, VI, xlii.

are loosely bandaged. The even bandage is for the extremities, face, ears, neck, penis, scrotum, back, sides, and abdomen."¹

Suśruta next deals with the alterations in the mode of applying bandages according to the rules laid down. He also advises the surgeon to be guided by the dictates of his common sense. He directs us to practise bandaging on the various large and small limbs of a human figure made of cloth or clay.²

With regard to the mode of application of bandages, Hippocrates says:³ "It should be done quickly, without pain, with ease and with elegance, it should fit well and neatly. The forms of it are the simple, the slightly winding (called *ascia*), the sloping (*sima*), the monoculus, the rhombus, and semi-rhombus".

The whole chapter of Suśruta is very interesting and will repay perusal. If bodily transferred, it will adorn any modern text book on surgery.

As it is very difficult to convey a correct idea of these bandages in words, I have given figures of them from modern works on surgery, from which their construction and uses will be readily understood at a glance.

¹ तत्र त्रयायतनविशेषादन्ध विमेषस्त्रिविधो भवति गाढः समः शिथिल इति ।

पीडयन्नरुजो गाढः सौख्यसः शिथिलः श्वेतः ।

नैव गाढो न शिथिलः समोऽन्धः प्रकीर्तितः ।

तत्र श्लिक् कुक्षि कक्षावङ्गशिरः शिरः सुगाढः । शस्त्रावदन कर्णकण्ठमेढुमुक्कपटपार्श्व-
दरमुष्ण समः । चक्षोः सन्धिषु च शिथिल इति ।

Suśruta Saṁhitā, I. xviii.

² पुस्तकं पुरुषाह प्रत्यङ्गविशेषेषु बन्धयोग्यः ।

Hind. I. ix.

³ The Genuine Works of Hippocrates, Vol. II, P. 477. Syd. Soc. Ed.

ABDOMINAL BINDER.

Caraka¹ mentions the use of abdominal binder for the recently delivered woman to prevent derangement of air by its expansion in her abdomen.

Dr. Barnes says:² "The sudden expulsion of one-tenth of the body-weight from the abdominal cavity is attended by a sudden removal of a force hitherto pressing upon the vessels and organs of the chest, abdomen, and pelvis. This entails in some cases a tendency to vacuum. Hence disturbance of the circulation. Now the binder, by supporting the abdominal walls, restores the equilibrium of pressure. The pressure exerted upon the uterus works as a gentle continuous stimulus to contraction. The woman is conscious of the support and is grateful for it. . . . The figure, so precious, and rightly so, to women, is better preserved So applied, the binder becomes one of the most efficient agents in antiseptic midwifery; it keeps the walls of the uterus and vagina in contact, thus preventing the collection of fluids or clots, and shutting out air".

The use of cloth for other surgical purposes is also mentioned:—

FIELD HOSPITAL.

The cloth is to be used for the manufacture of tents for the doctors to live in. The wounded in war are to be treated in such tents. The tent of the surgeon-general should be close to that of the king in the battle-field.³

¹ वैद्यदेवदरं महता वाससा तथा तस्मा न वायुसुदरे विक्रान्तिमुत्पादयन्मनवकाशलात् ।
Caraka Saṁhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II. p. 87.

³ सैन्यावारि च महति राजमैहादनकरे ।

भवेत् सन्निहितो वैद्यः सर्वोपकरणान्वितः ॥

Small tents are also recommended for applying vapour bath to patients.

DRESSINGS.

Dīḡhavaḷa¹ mentions the use of medicated gauzes to be used as sponge by the females and says: "In discharges from the vagina, pieces of cloth soaked in decoction of barks of Vata (*Ficus Bengalensis*) and Lodha (*Symplocos racemosa*) and dried, should be put inside the canal."

In the Mohāvāgga² we find the use of itch-cloth:—"I allow, O Bhikkhus, to whomsoever has the itch, or boils, or a discharge, or scabs, the use of an itch-cloth".

"According to the 90th Pakittiya such cloth must not be more than four spans in length and two in breadth."

I can not help quoting from Mohāvāgga,³ another discourse of Buddha as it shows clearly the surgical treatment of boils in ancient times:—

Now at that time a certain Bhikkhu had boils.

"I allow, O Bhikkhus, the use of the lancet".

Decoctions of astringent herbs were required.

"I allow, O Bhikkhus, decoctions of astringent herbs".

Sesamum salve was required.

ततस्तमेनं भजवदयः स्वाति समुद्धितः ।

उपसर्पेन्त्यमोहेन विषमल्लामयद्दिताः ॥

Suśruta Saṁhitā, I. xxxiv.

¹ नगोधलक् कषायिण क्षीवकल्कं तदा पिबेत् ।

वासावि क्षीमपटं वा भाषितं तेऽनुधारयेत् ॥

Caraka Saṁhitā, VI. xxx.

² Mahāvāgga. VIII. 17, 2.

³ Ibid. VI. 14, 4 & 5.

"I allow, O Bhikkhus, the use of sesamum salve".

5. Compresses were required.

"I allow, O Bhikkhus, the use of compresses."

It was necessary to tie up the sore with cloth.

"I allow, O Bhikkhus, the use of bandages for tying up wounds".

The sore itched.

"I allow you, O Bhikkhus, the sprinkling of a sore with mustard-powder".

The sore became moist.

"I allow you, Bhikkhus, to fumigate (the sore)."

Proud flesh formed on the wound.

"I allow you, O Bhikkhus, to cut off (proud flesh) with a lancet".

The wound would not close up.

"I allow, O Bhikkhus, the use of oil for wounds".

The oil ran over.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of fine rags, and of all kinds of ways of treating wounds".

If the object of fumigating the sore was to sterilize it, as it certainly was, we may take this dialogue as the best sketch of the scientific treatment of boils,—remembering that it represents the knowledge of surgery more than 2500 years ago.

Cakrapāṇi advises us to tie the ends of the hairs of a patient, by a piece of cloth,¹ before performing phlebotomy on the vessels of the head and neck.

¹ मृदुपद्मनिषिद्धो जातुस्पर्शितकर्मणः ।

4. CARMA OR LEATHER.

The use of leather in ancient medical practice in India was manifold.

Leather bandage.

Straps or belts of leather were used as bandages. Suśruta¹ advises us to apply the leather bandage in cases where more than half the thickness of the upper or lower extremities are cut by some sharp instruments in a slanting direction. Then the parts of the wound should be well adjusted, the bone and the soft parts kept in apposition, and the wound closed by sutures and well covered by dressings, over which the leather bandage is to be applied in the form of a gophaṇā or sling.

Leather bandage in the form of gophaṇā is mentioned by Suśruta² to be applied over the anus to prevent recurrence of pro-cidentia of the rectum. The prolapsed bowl should be well bathed with ghee and fomented; and then reduced by gentle pressure. There should be a hole in the bandage just in front of the anus to allow flatus to pass out. Vṛnda³ alludes to it. Similarly the modern surgeons use a pad supported by a bandage as an aid in

¹ See foot-note 1, P. 178.

² गुदमंशे गुदे निम्नं खेदाभ्यक्तं प्रवेशयेत् ।
कारयेद्गोफणावन्म मध्यच्छिद्रेण चर्मणा ॥

Suśruta Saṁhitā, IV, 22.

³ गुदमंशे गुदे खेदैरभ्यक्ताऽग प्रवेशयेत् ।
प्रविष्टं सौदवेशापि बद्धं गोफणा भगम् ॥

गोफणं वेति । गोफणा वन्मविशेषः ।

बद्धं हि—उत्तारनिर्गमाय मध्यच्छिद्रेण अर्मेणा चास्य गोफणावन्मः कार्यं इति ॥

Vṛndamādhava or Siddhayaoga, Ch. 57.

preventing descent of the gut. It is mentioned also in the *Cakradatta*¹ and the *Yogarātnākara*.²

Dr̥ghavala mentions the use of a piece of untanned leather to be applied over a layer of ointment during the day, while during the night the leaf of *Eraṇḍa* (*Ricinus communis*) is directed to be used.³

LEATHER LIGATURES.

In the treatment of snake-bite, a ligature is advised to be used above the seat of injury to stop the circulation of poisoned blood. This ligature is advised to be made of leather, or braided fibres of trees, or soft cord of jute, etc.⁴

YANTRA-ŚĀṬAKA. LITHOTOMY STRAP OR BINDING APPARATUS.

This is the name of the leather shackle, which is recommended to be used during the operation for stone in the bladder. The patient should flex his knees and elbows; and the parts are to be

¹ गुदमंशे गुदं स्नेहैरभ्यज्याऽऽद्य प्रवेष्टयेत् ।

प्रविष्टे रूधेदयेद्यापि बद्धं गोः कण्ठ्या हृदम् ॥

Cakradatta, Kṣandraroga Cikitsā.

² गुदमंशे गुदं स्निग्धं खेदेनाक्तं प्रवेष्टयेत् ।

प्रविष्टं रोधवेदयद्वाद्रव्यसञ्चिद्र चर्मेना ॥

Yogarātnākara, P. 343.

³ एरुण्डपत्रैः प्रच्छाद्य राशौ कण्ठं विमोचयेत् ॥

चौराम्बुषा ततः सिक्तं पुनर्वैद्योपनादितम् ।

मुखेद्राशौ दिवावद्धं चर्मेभ्यः सुलोमभिः ॥ ८४ ॥

Garaka Saṁhitā, VI. xxviii.

⁴ सर्व्वरेवाहितः सर्पः शालाददृष्ट्य देहिनः ।

दंशस्त्रोपरि वध्नीयादरिष्टायतुराहुते ॥

क्षीतचर्माम्बु-वल्कलानां रुद्धनाम्बुसमेन च ।

न गच्छति विषं देहमरिष्टाभिर्निवारितं ॥

Saṁgraha Saṁhitā, V. १

tied together by this instrument.¹ Similarly, it is to be used during the operation for piles; but then, according to Suśruta,² the neck and thighs are to be tied by the instrument which is to be held firmly by the assistants. Vāgbhaṭa³ uses cloth instead of leather.

Yantra-śūṭaka is also to be used during the operation of phlebotomy. Suśruta says⁴ : "If venesection is required to be done, the patient is to be seated on a stool, an aratni high (from the elbow to the end of the little finger), facing towards the sun. The thighs are to be flexed, the two elbows to be placed over the knees, and the hands (the fingers being clenched into fists) to be fixed on the two sides of the neck. The two ends of the shackle which pass over the fists, are held up at his back by the left hand of an assistant, who with his right hand steadily (neither forcibly nor loosely) presses above the part selected, to make the veins prominent, and at the same time rubs on the back to

¹ 'सङ्घृष्टितानुकर्पूरनितरेष सहाधवक्' सूत्रेण शाटकैर्वा ।

Suśruta Saṁhita, IV. vii.

² 'वक्त्रकन्धकोपविष्ट' यन्त्रशाटकेन परिचिन्तयौवासकचपरिकर्म्मिभिः सुपरिगृहीत-
मस्यन्दनयरीरं कृत्वा ।

Ibid, IV. vi.

³

अथ यन्त्रेण वाससा ।

सकथौ शिरोधरायाश्च परिचिन्तयन्नुद्धृतम् ॥

Aṣṭāṅga Hṛdaya Saṁhita, IV. viii.

⁴ तत्र व्याधिसिरे पुरुषे प्रत्यादित्यमुखनरविमाचोक्षिते उपवेष्टासुने सङ्घृष्टोराद्धितयो-
निर्वेद्य कर्पूरसन्धिवस्त्रोपरि हस्तावनयुंदाङ्गुष्ठकृतमुक्ती मन्थयोः स्थापयित्वा यन्त्रशाटकं
यौवासुखोरुपरि परिचिन्तयान्तेन पुरुषेण पश्चात्स्थितेन वानहस्तोत्तानेन शाटकान्तरेण वाहयित्वा
ततो वैद्यो ब्रूयाद्विषहस्तेन शिरोऽपवाधे नायावतमिविष्टं यन्त्रमावेष्टयेत्सङ्घातवाधे
यन् पृष्ठनये च पीडयेति कर्मपुरुषश्च वायुर्गुणं मुखं स्थापयेद्विष उत्तमाङ्गनामानमन्त्रं
वर्ज्यानां शिरसां व्यधेन यन्त्रविविधः ।

stimulate bleeding, the patient being then told to inflate his mouth with air forcibly. This is the method of binding for puncturing the veins of the head except those (veins) which have their mouths turned inside the body". Vāgbhaṭa describes a similar procedure in bleeding from the vessels of the neck¹.

The Greeks also used ligatures to tie up the arms and legs of a patient in the lithotomy position. Paul² says: "In operating, the woman should be placed on a seat in a supine posture, having her legs drawn up to the belly, and her thighs separated from one another. Let the arms likewise be brought down to her legs and secured by proper ligatures about the neck".

In modern times, similarly, we use lithotomy straps or crutch, after placing the patient in the lithotomy position during the operation of lithotomy and excision of piles.

PĀŚA.

This is a different shackle to be used for binding insane persons.³

¹ अग्नितापातपश्चिम्बो जानुबन्धन संस्थितः ।

सदृपद्मस्तकेशानी जानुस्थापित कूर्परः ॥

सृष्टिभ्यां वस्त्र शर्माभ्यां मन्त्रे वाङ्' निषीदयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

² Paul, VI. lxxiii.

³ भीमाकारेनैरैनांशैर्दोन्नेत्वाह्वये निक्षिपेः ॥

भीषयेत् सततं धाम्नेः कशामिन्त्रांश्च तादृयेत् ।

मन्त्रयित्वा सुपुनं वा वासयेत्' इत्यादिना ।

Saṁhitā, VI. lxxii.

ABDOMINAL BINDER.

The use of cloth binder has been described before¹. Leather binder is to be used after the operation of paracentesis abdominis to apply pressure over the abdomen. After draining the fluid of ascites, the abdomen of the patient should be well wrapped with blankets, or silk cloth, or leather binder, for then the abdomen would not be flatulently distended by air.²

LEATHER BAGS.

The use of leather in the formation of bags of the vasti-yantra has been described before³.

ŚĪRO-VASTI. LEATHER BAG FOR THE HEAD.

For application of oil on the head, Suśruta⁴ directs us to use a goat's bladder filled with medicated oil, just in the same way as ice bags are used nowadays.

Śārṅgadharma⁵ describes another variety of śiro-vasti: "It is

¹ See P. 181.

² निःसृते च दोषे गादृतरमाविक काशेय चर्मशामखतमेन परिवेष्टयेद्दरं तथा नाशाययति वायुः ॥

Suśruta Samhitā, IV. xiv.

³ See P. 129-30.

⁴ अज्वासीनस्य वध्नीयाद् वक्षिकोषं ततो दृढं ।

Ibid, VI. xviii.

⁵ शिरोवस्तिविधिरात्र प्रोच्यते सुचमन्मतः ।

शिरोवस्तिचर्मणः स्नादिमुखो रादशाङ्गुलः ॥

शिरःप्रमाणं तं वडा मलके मापयित्वा कैः ॥

सन्निरोधन्विधायानीं खेष्टः कोष्ठीः प्रपूरयेत् ॥

तावत् धार्यस्तु यावत् स्नाशानानि च मुखस्रुतिः ।

वेदनोपशमो वापि मावापां वा सङ्गच्छन् ॥

Śārṅgadharma Saṅgraha, III. xi.

made of leather, has a length of twelve *aṅguli* and has two orifices or mouths. The leather bag is to be well tied round the head, the junction of the circumference of the bag and the skin should be well pasted with *māṣa* (*Phaseolus Rox*) glue. Then the cavity thus formed is to be filled with hot oily medicine. This is to be retained until the headache is relieved." *Cakra-*
*datta*¹ also mentions it. The bag is described to be sixteen *aṅguli* high in the *Yogaratanākara*². *Vāgbhaṭa*³ advises us to use leather of a cow or buffalo, and it is said to have been twelve *aṅguli* broad.

LEATHER BAND.

In phlebotomy, a band is advised to be applied above the spot where the vein is to be punctured. This band is recommended to be made of cloth, or jute, or leather, or barks of

- ¹ आशिरौ जायत चर्म कृत्वाट्टुलमुच्छितम् ।
तेनावेद्य शिरोऽधस्तान्नापकत्वेन लिपयेत् ।
निदलक्षीपविटस तैलेरुचैः प्रपूरयेत् ॥

Cakradatta, Śiro-roga Cikitsā.

- ² आशिरौ वापितचर्मं द्वादशाङ्गुलमुच्छितम् ।
तेनावेद्य शिरोऽधस्तान्नापकत्वेन लिपयेत् ॥

Yogaratanākara, P. 402.

- ³ विधिलस निषलस्य पीठे जनुसमे मदी ।
ब्रह्माक्षिप्रदेहस्य दिनान्ते गन्धमाह्वयम् ॥
द्वादशाङ्गुलविलीचं चर्मपरं शिरः समम् ।
आकर्णं बन्धनं स्थानं ललाटे वल्लं वेदिते ।
चैलवेष्टिकया बद्धा माषकत्वेन लिपयेत् ॥
ततो यदाव्याधि शतं खेदं कोष्णं निषेचयेत् ।
ऊर्ध्वं कैशमूत्रो दावद्वाङ्गुलं धारयेच्च तम् ॥

Aśpāṅga Hṛdaya Sārāhitā, I. xxii.

trees, or tendrils of twining plants¹; and it should not be applied either too tight or too loose. As for example, in phlebotomy in the foot, the yantra-śāṭaka or ligature should be applied below the knee-joint, while the band is to be tied round, at a distance of four aṅguli above the part selected for the operation.² Vāgbhaṭa³ says: "In phlebotomy, a band is to be tied round the upper extremity, four aṅguli above the spot selected for opening the vein which is to be made prominent by pressing it upwards with the closed fist." Cakradatta⁴ also quotes it. Vāgbhaṭa⁵ recommends us to use a cloth band to be tied round the leg, four aṅguli above the spot selected for opening the vein in the leg.

This band corresponds to the band of Antyllus used by the Greeks. Antyllus applies a ligature of two fingers'

¹ गानं वक्षोपरि हृदं रज्ज्वा पटेन वा समम् ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

इक्षुपश्चश्चानन्त्येकललतानामन्यतमेन यन्त्रयित्वा नातिगार्दं नातिमिथिलं शरीरं प्रदेयमासाद्य यथोक्तं शस्त्रं गच्छीत्वा सिरां विधेत् ॥

Sūratra Saṁhitā, III. viii.

² तत्र पादव्यध्यसिरस्य पादं समेक्ष्यते सुस्थिरं स्थापयित्वा पादमौषत्सङ्कुचितमुच्चैः कृत्वा व्यध्यपादं जानुसन्धेरधः शोणकेनावेष्ट्य इक्षुभायां प्रपीठ्य मूलं व्यध्यप्रदेशोपरि चतुरङ्गुलम् श्रोतदोनामन्यतमेन वद्धा पादासिरां विधेत् ॥

Ibid.

³ विधेहस्तसिरां बाह्यावनाकुक्षितं कुपरे ।

वद्धा सुखोपविष्टस्य सुष्टिमङ्गुलं गर्भिणीम् ।

ऊर्ध्वं वेध्यप्रदेशाच्च शङ्कां चतुरङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

⁴ Cakradatta, *Sira-vyādhādhikāra*.

⁵ पादे तु सुस्थितेऽधस्ताज्जानु सन्धेर्निर्गोदिते ।

गार्दं कराभ्यामामुक्तं चरणे तस्य चोपरि ॥

द्वितीये कुक्षिते किञ्चिदाकृदे हस्तवन्ततः ।

वद्धा विध्यैर् सिरामित्यमनुक्षेप्यपि कल्पयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

breadth round the arm in bleeding at the elbow, while to bleed at the ankle, the band is to be applied at the knee. It is mentioned as fillet in the pseudo-Hippocratic treatise on Ulcers;¹ and Oribasius² gives an interesting dissertation on the subject, principally condensed from the works of Herodotus, Antyllus and Galen. Paul³ also ties a narrow band round some muscular part of the arm before abstracting blood from the inner part of the elbow. "Wherefore we must tie a narrow band around some muscular part of the arm, and having by friction of the hands upon one another produced the necessary fulness of the vein, we divide it transversely, but only along its breadth."

LEATHER BOTTLES, JARS, MAṢAKA, etc.

Leather was used in the manufacture of bottles and jars. Leather maṣaka for honey, Soma juice, and dadhi (curdled milk), is mentioned in the R̥gveda⁴ and also in the Laws of Manu where

¹ Ulcers, iii. 328.

² Med. Collect., vii, Phlebotomy.

³ Paulus Ægineta. Adam's Trans. Bk. VI. Sec. XL.

⁴ दतिरिव तेऽङ्गकमन्तु सख्यं ।

अङ्किद्वयं दधन्तः सुपूर्यसा दधन्तः ॥

R̥gveda, 6 M. 48 S. 4 A. 8 Ch. 18 v.

यो ह वां सधुनो दतिराङ्कितो रघवर्षदे ।

ततः पिबतमन्विना ॥

Ibid, 8 M. 5 S. 5 A. 8 Ch. 19 v.

अङ्किदं चम्बोभैर सोमं पवित्रं वा सज ।

नि षेडि गोरधि त्वचि ॥

Ibid, 1 M. 23 S. 1 A. 2 Ch. 9 v.

एष सोमो अचि त्वचि गवां कौडत्वदिभिः ।

इन्द्रं मदाय कौडवत् ॥

Ibid, 9 M. 66 S. 7 A. 2 Ch. 29 v.

it is called *drti*¹. Leather *maṣaka* or inflated skins were in use as swimming bladders, and we have a representation of "figures with garlands in their hands, swimming and disporting themselves, supported on *maṣaks* or inflated skins."² In the *R̥gveda*, *Agastya* in his spell to neutralise poison, says:³ "I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits."⁴ Dr. Mitra points out that "other *smṛtis* ordain that oleaginous articles preserved in leather bottles do not become impure by the contact of the impure cowhide; and in the present day, jars of that material are in extensive use in Bengal and the North-West Provinces for the storage of oil and ghee. In the latter place, leather bags are universally used for raising water from wells, and

इवति भीमो इषमस्तविष्यदा ग्रहे शिशानो हरिषी विचक्षतः ।

आ योनिं सोमः सुकृतं नि वीदति मन्ययो लग्भवति निर्णिगम्ययौ ॥

R̥gveda, 9 M. 70 S. 7 A. 2 Ch. 7 v.

एष स्य मानुषदियतिं युज्यते रथः परिक्रमा दिवो अस्य सानवि ।

एचासो अग्निमिधुना अग्निं चयो इतिस्तुरीयो मधुनो वि रपृते ॥

Ibid, 4 M. 45 S. 3 A. 7 Ch. 1 v.

See Wilson's *R̥gveda*, II. 28.

¹ इन्द्रियाणां तु सर्वेषां यद्येकं चरतीन्द्रियम् ।

ततीह चरति प्रज्ञा हतेः पादादिवोदकम् ॥

Manu Saṁhitā, II. 99.

"But when one among all his organs fails, by that single failure his knowledge of God passes away, as water flows through one hole in a leathern bottle."

Ibid, Jones' Translation.

² Pl. xxxi. fig. 1. Fergusson's Tree and Serpent Worship, P. 127.

³ त्वं विषना सज्जानि इति मुरावतो गृहे ।

R̥gveda, 1 M. 191 S. 2 A. 5 Ch. 10 v.

⁴ *Ibid*, Wilson's Translation.

according to the law books of Śaṅkha and Likhita,¹ that water is declared pure which is kept in old leather bottles"². To this may be contrasted the prevailing Hindu notion that water is defiled if touched by a Brāhmana in his shoes. Though the leather is not allowed to be a material of dress of the Hindus, except his shoes which are considered as unclean, leather belts formed one of the eight sacred utensils necessary for a śramaṇa of the Buddhist order; and in the Manu Saṁhitā³ we find the students of theology advised to "wear for their mantles, the hides of black antelopes, of common deer, or of goats."⁴

5. ANTARVALKALA. THE INNER BARKS OF TREES.

Barks of trees are recommended to be used as splints for the support of fractured bones. In fractures of bones of the foot, leg and thigh, Suśruta directs us to use splints made of barks of trees⁵ to surround the limbs. In the treatment of a simple fracture, Bhāva Miśra advises us to use cold water first, then mud is to be applied, and lastly the fractured bones should be secured

¹ आपो ह्यपवदन्त्यवत्यः परिग्रहः जीर्णचर्मकरणकेवमुच्यते ।

चर्मकरणः चर्मपुटः ।

Śaṅkha and Likhita.

² Dr. R. C. Mitra's Indo-Aryana, vol. II.

³ कार्शरीरवस्त्रानि चर्मणि ब्रह्मचारिणः ।

वसीरद्रानुपूर्वेण शालसीमाविकानि च ॥

Manu Saṁhitā, II. 41.

⁴ Ibid. Sir Wm. Jones' Translation. II. 41.

⁵ अश्वज्य सपिषापादं तदभयं कुशोत्तरं ।

वस्त्रपट्टेन वक्षीयात्र च व्यायानमाचरेत् ॥

Suśruta Saṁhitā, IV. iii.

by splints and bandages.¹ In the *Yogarātnākara*², we are advised to treat fractures, by lowering the raised end and elevating the depressed end of the bone, and then by using splints and bandages to keep them in position. *Bhāva Miśra*³ describes it similarly after *Suśruta*. *Suśruta* directs us to use barks of *Vata* (*Ficus Indica* Rox.) and bamboo strips as splints to support the neck after reducing its dislocation by holding at the temporo-maxillary articulations on the sides and the occipital protuberance on the back, and raising him up in the air. He should lie down with his head raised for seven days⁴. In modern times, the Sayre's suspension apparatus and jury mast serve the same purpose.

The barks of *Madhuka* (*Bassia latifolia*), *Aśvattha* (*Ficus religiosa*), *Kukubha* (*Terminalia arjuna*), *Polāśa* (*Butea frondosa*, Rox.), *Udumbara* (*Ficus glomerata*, Rox.), bamboo, *Sāla* (*Shorea robusta*), *Vata* (*Ficus Indica* Rox.) are mentioned as

¹ 'वादी भग्न' विदित्वा तु संचयेच्छीतलाम्बुना ।

पङ्कनालिपनद्वार्यं बन्धनञ्च कुशान्वितम् ॥

Bhāva Prakāśa, II. iii. *Bhagnādhikāra*.

² पङ्कनालिपनं कुर्याद्बन्धनं च कुशान्वितम् ।

बन्धनान्वितमुद्राम्बोदुन्नतं चावपीडयेत् ॥

विश्रः शिषापि च स्थाने संस्थाप्य विधिमाचरेत् ॥

Yogarātnākara, P. 345.

³ बन्धनान्वितमुद्राञ्च दुन्नतचावपीडयेत् ।

आम्बोदतिविश्रमधोगतचोपरि वर्तयेत् ॥

Suśruta Samhitā, IV. iii.

Bhāva Prakāśa, II. iii. *Bhagnādhikāra*.

⁴ 'बन्धनावयवद्वयोश्च' इत्यल्लोभस्येन्द्रं ।

तथा कुशान् समंदत्तु । बन्धपट्टेन वेष्टयेत् ।

उत्तानं शाययेद्देनं सप्तरात्रमन्तर्हितः ॥

Suśrutā Samhitā, IV. iii.

supplying the materials of splints¹. Bhāva Miśra² adds Kadamba (*Anthocephalus cadamba*), Hijjala (*Barringtonia acutangula*), Sarjja (*Pinus longifolia*) to the list. Such splints are called kuśa, and Vāgbhaṭa³ says that the splints should be broad, thin, pliant and clean.

Dr. Jacobi, of Dublin, says that he has seen an excellent splint made from the "fresh bark of a tree, taken off while the sap is rising". "It fits admirably", says he, "just like paste-board soaked in water"⁴. Dr. C. C. Jewet⁵ recommends for the same purpose the bark of *leriodendron*, or tulip tree.

THE CRUTCHES.

The crutches were used to help the crippled. In the Vajasaṇīya Saṁhitā of the White Yajurveda, there is a passage describing the different kinds of human victims, appropriated to particular gods and goddesses. The passage occurs also in the Taittirīya Brāhmaṇa with slight differences. There we

¹ मधूकोदुम्बराक्षय पलाश ककुभलवः ।

वंशसञ्ज्ञं बटानां वा कुशार्थमुपसंहरेत् ॥

Saṁhita, IV. iii.

² मधूकोदुम्बराक्षय कदम्ब निचुललवः ।

वंशसञ्ज्ञां चूनानाञ्च कुशार्थमुपसंहरेत् ॥

Bhāva Prākāśa, II. iii. Bhagnādhitā.

³ कदम्बोदुम्बराक्षयसञ्ज्ञां चूना पलाशजैः ।

वंशोद्भवे वां दृष्टुमि क्षतुभिः सुनिवेशितैः ॥

सुश्रवणैः सुप्रतिशब्दैः वृत्तकैः शकलैरपि ।

कुशाद्भवेः समं बन्धं पश्येत् सोऽपि ज्ञेयः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxvii.

⁴ Hamilton's Fractures and Dislocations. 5th Ed. P. 50-51.

⁵ The 20th Mass. vols.

find "to the two (deities) who preside over the gains above or below one's expectation (utkula and vikula), a cripple, who can not move even with the help of a crutch" is recommended to be sacrificed. And again "to the divinity of land, a cripple who moves about on a crutch."¹

The use of the sound limb as a splint of support for the fractured bone of the opposite side was well known. Wooden splints resembling in shape the injured member are also recommended. Suśruta says² that if the hand be fractured, it is to be tied with the opposite hand, but in fractures of both the hands, Gayadāssa³ recommends a wooden hand to be used as a splint for both. After union of the fractured bones, the hands should be made to hold balls of cow-dung, mud and stones.

6. LATĀ OR CREEPERS (TENDRILS OF).

The tendrils of creepers as materials of ligature are mentioned

¹ उत्कुलविकुलाभ्यां (उत्कुलविकुलिभ्यः) विस्त्रिन' ।

भुम्भे पीठसर्पिनमालभते ।

Taittirīya Brāhmanya.

Quoted in Mitra's Indo-Aryans. vol. II. P. 84—85.

² उभे तले समे कृत्वा तलभग्रस्य देहिनः ।

वध्नीयादामतैलेन परिषेकञ्च कारयेत् ।

प्राग् ग्रीमयमयं पिण्डं धारयेन् मृत्तयं ततः ।

इमे जातवन्ति चापि कुप्यान् पाण्डुः ॥

Suśruta Saṁhitā, IV. iii.

³ यद्येतु उभेऽपि हस्ततले तलेकस्य भङ्गे वामे दक्षिणेन दक्षिणं वामेन, उभयोस्तुभङ्गेन तत्कमेन, काष्ठमयेन कृत्वा च अपि वध्नीयादेवं दातुं भवतीति, मृत्पिण्डादिधारणमात्रकथं प्राशयेन् ।

Quoted in Dallana's Commentary, IV. iii.

by Suśruta. He recommends¹ to give up a patient, bit by a snake, as hopeless when he does not respond to the application of stimuli, such as cold water, tendrils of creepers, etc. Vāgbhaṭa² advises us to introduce the stalk of the lotus, with a thread tied to it, inside the throat to extract any foreign body stuck there. When the soft stalk is touched by the śālya, it should be extracted by the sudden withdrawal of the stalk and thread.

7. VĀSTRA OR CLOTH.

Cloth³ as a material of bandages, tents, gauze, etc. has been described before⁴.

8. AṢṬHĪLAŚMA. STONE OR PEBBLE.

It is a piece of stone—long and round. It is advised to be used for moving arrows fixed in the bone⁵. Caraka⁶ advises us to strike two pieces of stone against each other to resuscitate a

- ¹ अजीर्णं पितातपं पोद्धितेषु बालप्रमेहेष्वथ गर्भिणीषु ।
 इडातुर चीचवुमुचितेषु रुचेषु भीरुष्वथ दुर्हिनेषु ॥
 शस्त्रघने यस्त्र न रक्तमस्ति रात्र्योलताभिश्च न सम्भवन्ति ।
 शोताभिराहिश्च न रोम इषीं विद्याभिभूतं परिवर्ज्यते ॥

Suśruta Saṁhitā, V. lii.

- ² कच्छस्रोतोगतं शल्यं सूत्रं कच्छे प्रवेशयेत् ।
 विसृज्यात् ततः शल्यं विभं मूर्तं समं हरेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

- ³ वस्त्रं प्रसिद्धं तूलकं मृदनिर्मितं वेष्टनायै प्रयुज्यते ॥

Vāgbhaṭatārtha Kaumudī, I. xxv.

- ⁴ See P. 176-83.

- ⁵ अग्नप्रसारखण्डं शस्त्रपीडनायै निघातनायै युज्यते ॥

Ibid.

- ⁶ अग्नानोः संघर्षं कर्षयामुंशौ शोतोदकेनोषोदकेन वा सुखपरिधेकः ।

Caraka Saṁhitā, IV. viii.

still-born child. In bleeding from the veins of the neck, Vāgbhaṭa¹ advises the patient to hold firmly two pieces of stones in their hands.

A piece of stone is to be used by a person, for holding it with his hand, after recovery from fractures of the carpal and metatarsal bones².

In ancient times, in India, the kings used to decorate themselves with antidotary gems, as a safeguard against poisons.³ Even now the snake charmers apply a black stone on their bodies where they are wounded by the venomous reptile. This stone is popularly known as the vi-a-pāthara or poison-stone, and is supposed to have the property of extracting poison from the body.

9. MUDGARA. HAMMER.

Suśruta directs us to use a hammer or a piece of stone to strike an arrow firmly fixed in the bone, until loosened, when it can be conveniently extracted by means of a pair of forceps⁴. It should be pointed out that the tubular instrument—śalya

¹ पापावर्गमङ्गलस्य जातुष्टे प्रसूते भूजे ।

कुचेरारम्य हृदिने विध्येद्वर्णपरके ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

² See foot-note. 2. P. 196.

³ विषद्वैरुदके स्नातो विषघ्नमणिमूयितः ।

परौचितं समद्वौषाणाङ्गुष्ठाविद्विषम्बृतः ॥

Kāmandakiya Nītiśāra, Ch. vii. v. 10.

रचितो गङ्गुरोद्धार मन्त्रियस्य विमूयत् ।

स्वावरं जङ्गमं तस्य विषं निर्जिह्वितो ब्रजेत् ॥

⁴ अस्त्रिद्वयोमुच्छ्रित महीलाग्रमुद्गराणामन्यतमस्य प्रहरिष्य विद्याल्य यदामागमेव ।

Suśrutā Saṁhitā, I. xxvii.

nirghātānī—described before¹, served the same purpose. Vāgbhāṭa also uses a hammer² to shake an arrow fixed in the bone, and directs us to extract it with the hands or by the various kinds of forceps³.

The Greeks used some iron instrument to shake such an arrow from the place where it was lodged. The hammer was also used by the Greeks and Romans but in a different capacity. Paul mentions its use in cranial surgery to strike the lenticular and gouge⁴. Paul and Celsus describe a “method of extracting foreign bodies from the ear by laying the patient on a board and striking the under side with a mallet.”⁵ Vāgbhāṭa describes this method for draining out water from the ear.⁶

10. PĀNIPĀDATĀLA. THE PALM OF HAND AND SOLE OF FOOT.

11. AṅGULI OR FINGERS.

The surgeon's hand is considered by Suśruta to be the principal instrument as the use of all other instruments depends

¹ See P. 111.

² मुद्राहता नाद्या निर्वायोत्पुष्टितं हरेत् ।

तेरेव चानयेन्मार्गमार्गोत्पुष्टितं तु यत् ॥

Aṣṭāṅga Hrdaya Saṁhita, I. xxviii.

³ क्वाहरेत् करमात्रं करौवेतरत् पुनः ।

हस्तं सिंहादिमकरवर्तिः कर्कटकाननेः ।

चटस्थं त्र्यसंस्नानाद् यक्षीतुं मन्त्रते यतः ।

कश्च भद्राश्च कुरर शरारी वायसाननेः ॥

Ibid.

⁴ Paulus Aegineta VII. xc.

⁵ Milne, Graeco-Roman Surgical Instruments, p. 125.

⁶ कर्णोन्मु पूर्व हस्तेन मथित्वा तैलवारिणी ।

विपेदधीमुखं कर्णे हन्वाद्या दूषयेत् वा ॥

Aṣṭāṅga Hrdaya Saṁhita, I. xxviii.

upon it¹. But again he mentions the hand and foot as accessory to, or substitutes for, the instruments. Longmore² says: "Of all instruments for making a complete examination of a gun-shot wound as well as for exploring for foreign bodies which may be lodged in it, the finger of the surgeon is the most appropriate, whenever a wound is large enough to admit of its insertion." There are many instances of the use of hand and foot in the treatment of surgical diseases but I shall point out a few of them.

1. Both Suśruta³ and Cakradatta⁴ say that "if a swelling be hard but slightly painful, then it should be well fomented, pressed and rubbed by a piece of bamboo, or palm of the hand, or thumb to cause its subsidence. Bhāva Miśra also quotes this verse⁵. Suśruta⁶ and Vāgbhaṭa⁷ recommend a similar treatment for enlarged glands.

¹ See foot note, P. 90.

² Longmore, Gun-shot Injuries, 1877, P. 319.

³ अभ्यज्य स्वेदयित्वा तु वेणुना वा शनैः शनैः ।

विमर्दं धेनुर्यक् प्राशस्तलेनाङ्गुलकेन वा ॥

Suśruta Saṁhita, IV. i.

⁴ अभ्यज्य स्वेदयित्वा च वेणुनाद्याततः शनैः ।

विस्त्रापनाद्यं मञ्जीयात् तलेनाङ्गुलकेन वा ॥

Cakradatta, Vṛnṣaśoṭha Cikitaṁ.

⁵ अभ्यज्य स्वेदयित्वा तु वेणुनाद्या शनैः शनैः ।

विमर्दं धेनुर्यक् मन्दनलेनाङ्गुलकेन वा ॥

Bhāva Prakāśa, II. iii.

⁶ छतेषु दोषेषु यथानुपूर्वं यस्मै भिषक् श्रेष्ठः सन्नुत्थितेत् ।

सिद्धस्य विस्त्रापनमेव कुर्यादङ्गुलमोक्षोपलवेण दृष्टेः ॥

Suśruta Saṁhita, IV. xviii.

⁷ संस्वेद्य बहुयोग्यं विमञ्जीयात् पुनः पुनः ।

Aṣṭāṅga Hṛdaya Saṁhita, VI. xxx.

2. *Suśruta* says¹ that "when a morsel of food sticks in the throat, a blow should be fearlessly struck with the fist on the shoulder of the patient without his knowledge". *Vāgbhāṭa*² also describes it.

It is however curious to find that exactly the same procedure was adopted by *Alsaharavius*. *Adams* in his commentary³ on *Paul* says that "when a morsel of food sticks to the oesophagus, *Alsaharavius* directs that the person should be struck on the back, which will facilitate the descent of it".

3. In the reduction of dislocation of the lower jaw, *Caraka* used his fingers to do it exactly in the same way as recommended by the modern surgeons. He directs us to depress the lower jaw by the thumbs and at the same time to raise the chin by the index fingers⁴. The verses are quoted by *Cakradatta*.⁵ The description of the method, quoted from any modern text book, would be a good commentary on the above passage of *Caraka*. *Erichsen* says⁶: "The reduction is best effected, by the surgeon,

¹ यास्यत्येतु कष्टासक्तो निःशङ्कमनबुद्धस्तस्ये मुष्टिनाभिदन्त्यात् खेदं मथं पानीयम् वा पाययेत् ।

Suśruta Samhitā, I. xxvii.

² अस्थानं क्लृप्तघाताभ्यां यास्यत्येव प्रविशयेत् ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

³ *Adam's Commentary on Paulus Aegineta*, VI. xxxii.

⁴ व्याप्तानने हनुं स्निग्धमृदाभ्यां प्रपीय च ।

प्रदिग्गिनीभ्याञ्चोद्वस्य चित्तुकोद्वसनं हितं ॥

सक्तां सङ्गमयेत् स्थानं सक्तां स्थितं विनामयेत् ।

प्रत्येकं स्थानद्वयादिक्रिया वैशेष्यमाचरेत् ॥

Caraka Saṁhitā, VI. xxviii.

⁵ *Cakradatta*, *Vāṭabyādhi Cikitsā*.

⁶ *Surgery*, Vol. II, p. 658.

standing before the patient, placing his thumbs, well protected by napkins, or a few turns of a narrow bandage, on the molar teeth on each side, and then depressing the angles of the jaw forcibly, at the same time that he raises the chin by means of his fingers spread out and placed underneath it."

4. Caraka says¹: "After pairing her nails and covering the tip of her index finger with cotton, the nurse is to clean the palate, lips and throat of the new-born child".

With this passage we may compare what Barnes says on the point². "The attendant having then placed the child close to the mother, so as to avoid any strain on the cord, should cleanse its mouth from any fluids, such as blood and mucus, it may have partially swallowed during its passage through the vagina. This should be done at once, as such fluids drawn into the lung vesicles may give rise to inflammation of the lungs, or even septicæmia."

5. Suśruta³ recognises "six modes of diagnosing diseases, namely by the five senses *i.e.* by hearing, smell, taste, sight and touch, and by questions. "Symptoms discernible by the sense of touch are coolness or heat, smoothness or roughness, softness or hardness, and other tangible qualities of the skin in fever, dropsy,

¹ अद्याश्च तालोष्ठकच्छ जिह्वाप्रमाज्जनमारभेत अङ्गुल्यामुपरिलिखितनखया सुप्रचालितो-
पधानकापांसपिपुमया प्रथमं प्रमाज्जितस्याश्च च शिरस्त्रालु कापांसपिपुना श्लेष्मर्मेन प्रति-
च्छादयेत् ।

Caraka Saṃhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II, p. 105.

³ बहुधा हि रोगाणां विज्ञानोपायः । तद्यथा पक्ष्मि श्रोत्रादिभिः प्रवेष्टुं शक्नोति ।

* * * * * स्पर्शनेन्द्रियविशेषाः श्रोत्रोच्छ्रस्त्र कर्कशसदृकठिनतादयो ज्वरशोकादिषु ।

Suśrutā Saṃhitā, I. x.

and other diseases." And we know how important it is to educate the tactile sense in the diagnosis of diseases.

6. The foot is recommended to fix a part of the human body whence any foreign body may be removed easily by the hands.¹ Suśruta says²: "If a foreign body cannot be easily extracted, as when it is impacted in the hollow or the substance of a bone, the part should be pressed by the feet, and it should be drawn out by the instrument." Vāgbhaṭa also gives a similar description³. Caraka describes a method of removal of the placenta if not spontaneously separated. One of the female attendants should press upon the navel of the puerpera forcibly with her right hand, while with the left hand placed upon her back, she should shake her. Then the heel is to be placed on the patient's buttock while the two sides of the gluteal regions are also to be pressed and shaken⁴.

12. JIHVĀ OR TONGUE.

The organ of taste as a means of diagnosis is noted by

¹ पाद इति पादेन शरीरदेशं धृत्वा कृसादियन्नेष चङ्करणादि क्रियते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

² अस्त्रिविवरप्रविष्टं अस्त्रिविदष्टं वाऽवगच्छ पादाभ्यां यन्नेषापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

³ अस्त्रिदष्टं नरं पदभ्यां पीडयित्वा विनिर्हरेत् ।

इत्यश्वको मुचलिभिः सुगृहीतस्य किङ्करैः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

⁴ तस्याद्येदमरा न प्रपन्ना स्नादयेनामन्यतमा स्त्री दक्षिणेन पाणिना नाभिरुपरिहासयन् निपीय सज्जेन पाणिना पृष्ठत उपसंगच्छ मुनिर्हृतं निर्हृतुयात् । अथास्याः पादपार्श्वान् ओषीमाकोटयेदस्याः स्निग्धाङ्गुपसंगच्छ सुपीडितं पीडयेत् ।

Caraka Saṁhitā, V. vii.

Suśruta¹. "Symptoms discernible by the sense of taste are the various tastes noticeable in morbid secretions of urine and other diseases". Cakrapāṇi "explains that 'inference' is necessary, because the sense of taste can not be exercised by the physician on the patient directly;"² he must do it through some intermediate agents such as ants, whose attraction to sugar is well-known and so the presence of sugar in urinary diseases can be inferred."

13. DANTA OR TOOTH.

Ivory as a material of surgical instruments has been described before³. Suśruta⁴ advises us to use the ash of ivory with stibium as a stimulant to the growth of hair on a scar. It is also recommended by Vāgbhaṭa⁵.

14. NAKHA OR NAILS.

Suśruta advises the surgeon to use his nails⁶ for the operation of cutting, piercing and extraction, if these can be possibly helped by his nails.

In modern times, nails often help the surgeons in separating

¹ रसनेन्द्रियश्रेयाः प्रमेहादिषु रसविशेषाः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. x.

² Hærnle's Commentary on the *Suśruta Saṁhitā*, I. x. (Bibliotheca Indica).

³ See page 67.

⁴ इक्षौदनमग्नौ कृत्वा सुख्यैव रसाञ्जनं ।

शेमाश्वतेन जायते लिप्ता पानितलेष्वपि ॥

Suśruta Saṁhitā, IV. i.

⁵ तैलाक्ता इक्षिदलस्य मयी वा चीषर्धं परम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxiv.

⁶ आहार्यं चैव मेदेषु नखं शक्यं योजयेत् ।

Suśruta Saṁhitā, I. viii.

layers of tissues during operation as in the operation for the radical cure of hydrocele. We often extract thorns, impacted in our body, with our nails.

15. MUKHA OR MOUTH.

The use of mouth as a suction apparatus was well known to the ancients. Suśruta advises us to use āṛā or pāpimantha (awl) to perforate bone in diseases of the medullary canal, caused by obstructed and deranged air. He next introduces one end of a tube, open at both ends, into the canal through the perforation in the bone, while through the other end the surgeon sucks out air by his mouth¹. The use of mouth for sucking out air through the śṛṅga or horn has been described before². Caraka says³ that the poison of a snake-bite may be sucked out by the surgeon's mouth, filled with flour or ash. Even in modern times, it is common amongst Indians to suck out blood, in accidental cuts by knives, by the mouth. The practice of the suckers in Europe has been noted before⁴.

16. VĀLA OR HAIR.

Horse-hair is to be used for applying ligatures round the piles⁵. It is also a material of suture for the skin. Horse-hair is also described to have been used for raising pterygium. Paul⁶ also used horse-hair to raise a pterygium.

¹ निरुद्धेऽस्थनि वा त्रायी पाणिमन्त्रेन दारिते ।
नाडीं दन्तस्थानि भिषक् चुषयेत् पवनं क्ली ।

Suśruta Saṁhitā, IV. iv.

² See P. 148-49.

³ दंशे वा चूषेन्मुखेन यवचूर्णपांशुपूर्णेन ।

Caraka Saṁhitā, VI. xxv.

⁴ See P. 149-50.

⁵ बालः, अन्नादीनां पूष्कभक्तेषा दक्षिणाय अग्नें वात्यादि वन्धनार्थं युज्यते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

⁶ Paulus Ægineta, VI. xviii.

Suśruta¹ says: "Bundles of hairs or tents are to be used in the treatment of wounds in the skull, formed by the extraction of an arrow from the brain. These would prevent the hernial protrusion of the cerebral substances from passing out through the wound. The hairs are to be removed one by one, as the wound heals up gradually." Vāgbhaṭa² also approves this treatment.

A bundle of hairs tied to a long thread is mentioned by Suśruta to have been used for the extraction of fish-bones from the throat³. The patient is directed to swallow the ball of hairs with some liquid. Next emetics are to be administered to excite vomiting. During this act, the foreign body gets entangled in the meshes of the ball, which being then suddenly pulled out by the thread outside, extracts the fish-bone satisfactorily. Vāgbhaṭa⁴ also describes it similarly. For this purpose

¹ शिरसोऽपहतं शल्यं बालवर्णिं प्रवेशयेत् ।

बालवर्ण्यमदन्तया ममालुङ्गं ब्रूयात् सवेत् ॥

Suśruta Saṁhitā, IV. ii.

² काव्यां शल्याहते विहे भद्रादिदलिते क्रिया ।

शिरसोऽपहतं शल्यं बालवर्णिं प्रवेशयेत् ॥

ममालुङ्गसुते कुडो हन्यादेनं चलोऽन्यथा ।

ब्रूये रोहति चैकैकं शनैरपनयेत् कचम् ।

ममालुङ्गसुतैः खादेन्मणिष्कानन्यजीवजान् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxvi.

³ अस्मिन्शल्यमन्यथा तिर्यक्कृच्छासज्जनवेष्टा किमोस्तु कं हृदे क मृतवत्तं द्रवभक्तोपहितं पयवेदाकृच्छाच पुंश्चकोष्ठं वामवेदमतय शल्यं कदेशसक्तं शाला सुतं सहसा त्वाचिपेत् ।

Suśruta Saṁhitā, I. xxvii.

⁴ कोशोन्मुक्तिं पीतेन द्रवैः कण्टकमाचिपेत् ।

सहसा मृतवतेन वमत सौन चेतरेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

a tooth brush formed by chewing the end of a narrow branch of a tree is also recommended¹. A common domestic remedy is to make the patients swallow large morsels of boiled rice, plantain, etc.

Paul² mentions a similar contrivance, and says: "Some are of opinion that the patient ought to be made to swallow large morsels, such as stalk of lettuces or pieces of bread; but others direct us to bind a thread about a small piece of clean soft sponge and give it to the patient to swallow, and then taking hold of the thread to draw it up, and to do this frequently in order that the thorn may get fixed in the sponge and be brought up". For this purpose Aetius used the epilation forceps. Paul calls it *acanthobolus* or the fish-bone forceps.

The modern surgeons use a probang for the same object. "Small sharp bodies, such as bristles, fish-bones, or pins, are generally found sticking between the pillars of the fauces and the tonsils." Such bodies "should not be pushed on, but an endeavour should be made to catch them with the "horse-hair probang." This being pushed gently, unexpanded, beyond the point where the pin or bone is stuck, is expanded by pulling up the handle and then withdrawn with a slight rotatory motion."³

Caraka⁴ mentions the practice amongst the recently delivered

¹ मृदुना वा दन्तधावनकुशेकेनापहरित् ।

Saṁhita, I. xxvii.

² Paulus *Aegineta*, VI. xxxi.

³ Swain's *Surgical Emergencies*, 3rd ed., Pp. 32-33.

⁴ अथास्या बालवेद्या कण्टालो परिशरेत् ।

Caraka Saṁhita, IV. xviii.

women to push a braid of her hair into her throat, to help the expulsion of the placenta. So in the *Yogarātnākara*¹, her throat is advised to be rubbed by a finger surrounded by hairs. This practice is still prevalent among the women of Bengal to a certain extent.

SUTURE MATERIAL.

Horse-hair was the material used by the Hindus for sutures. Besides it, they used² sutures of fine thread, or the fibres of the bark of *Aśmantaka* (*Cæsalpina digynia*), or threads made of hemp or flax, or of the fibres of which bow-strings were made, or of the fibres of the *Mūrvā* (*Sansevieria zeylanica*) or *Guḍūcī* (*Tinspora cordifolia*). Besides these, the Hindu surgeons used the mouth parts of the ants as clasps to close incisions on the intestines. *Suśruta*³ describes the use of living black ants to close the incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the scyballi, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision,

¹ किमपिष्टव्याकुला तस्याः कण्ठं प्रघर्षयेत् ।

Yogarātnākara, P. 437.

² सौख्येन सूक्ष्मैश्च सूत्रैश्च वल्केनायकलकस्य वा ।

सुनजचीमसूत्राणां खाद्यां बालिनं वा पुनः ॥

सूत्राण्युदुचीतानि च ।

Suśruta Saṁhitā, I. xxv.

खाद्यां सूत्रैश्च वल्केले ।

सौख्येन दूरे नासन्ने गृहान्नास्ते न वा बहु ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxix.

³ परिखाविच्छाद्यैवमेव शल्यसुज्वल्यान्खाद्यान् संशोध्य तच्छिद्रमन्त्रं समाधाय कृष्ण-
पिपीलिकाभिर्देशयेत् दष्टं च तादां कायानपहरिन्न सिरांसि ततः पूर्व्ववत् सौख्येन ।

Suśruta Saṁhitā, IV. xiv.

in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them. Caraka¹ also describes the use of ants for obliteration of small perforations in the intestines, but he takes away the ants before replacing the gut into the abdominal cavity. If by any accident, the abdominal muscles be incised and the intestines come out of a gaping wound, Suśruta recommends us to allow black ants to bite the exposed coils of intestines before replacing them into the abdomen². This is a curious practice of ancient surgery of the Hindus. The Greeks and Arabs never mentioned it. "Amongst some Indian tribes, it is customary to allow both edges of a wound to be seized by the sharp head-nippers of certain ants, whose bodies are then rapidly cut off; one ant after another being used, the wound is closed."³

Suśruta describes four sorts of sutures, viz:

1. Vellitaka or winding.
2. Gophaṇikā or like a sling.
3. Tunna sevani or continued sutures.
4. Rjugranthi or interrupted sutures.

¹ क्षिद्राण्यनस्य तु स्थूलैर्देशयित्वा पिपीलिकैः ।
 बहुशः संयद्हीतानि मत्वा च्छित्वा पिपीलिकान् ।
 प्रतियोगैः प्रवेष्ट्वान्नं बहिः स्त्रीलेदं ज्ञातं ततः ॥

Caraka Saṁhitā, VI. xviii.

² अग्निद्रवस्य निष्कासं प्रवेष्टुं नान्यथा भवेत् ।
 पिपीलिकाशिरोयुक्तं तदाप्येकं बदन्ति तु ॥
 प्रचाल्य पयसा दिग्धं त्वणशोषितं पाण्डभिः ।
 प्रवेष्टव्यं कृत्स्नखो हृतेनाक्तं ग्रनेः ग्रनेः ॥

Suśruta Saṁhitā, IV. ii.

³ Neuburger's History of Medicine. Playfair's Translation, Vol. I., P. 9

These are advised to be so applied as they may suit the different parts of the body¹. The needles must not be introduced either too far from, or too close to the edges of the wound. In the former case, the lips of the wound shall be inflamed and so cause pain, while in the latter, the sutures will give way².

The use of horse-hair as a material for suturing wounds was unknown to the Greeks and Romans. They used sutures of flax and woollen threads for wounds. Paul says: "Afterwards we unite the separated parts with a needle containing a woollen thread, being satisfied with two sutures."³ Celsus⁴ advises us to use sutures of soft thread; and the apolinose of Hippocrates⁵ is directed to be made of crude flax.

17. AŚVAKATAKA. THE RING OF A HORSE'S BRIDLE.

Suśruta says that when the arrow is firmly fixed in the bone and if it can not be extracted by forcible pulling by hands or instruments, it should be tied to the ring of a horse's bridle. Then the animal is to be whipped, when by the sudden movement of the horse, the weapon would be jerked out of the wound⁶.

18. ŚĀKHĀ OR BRANCH OF A TREE.

Another method is to tie such an arrow by means of a rope

१ सौन्धेद्विजितकं शनैः ।
 सौन्धेद्रौफणिकां वापि सौन्धेदा मुद्गमिवनीं ।
 सज्जुयन्मियो वापि यथायोगमथापि वा ॥

Suśruta Saṁhītā, I. xxv.

¹ Paulus Aegineta, VI. xii. Adam's Translations.

² Celsus, V. xxvi.

³ Hippocrates, iii. 132.

⁴ अश्वकटकं वा वध्नीयादथैनं कशया ताडयेद्यद्योन्नमयन् शिरोवेगेन शल्यमुद्धरति ।

Suśruta Saṁhītā, I. xxvii.

to the branch of a tree, lowered by pressure¹. When the pressure is released, the branch suddenly goes high up, and thereby it pulls the weapon out of the wound². Dallana, however, mentions another view that a bridle-ring and a branch of a tree are both required for the extraction of foreign bodies³. Hærnle remarks: "The branch apparently is put through the ring to afford a stronger pull"⁴. Vāgbhaṭa⁵ also mentions these contrivances.

19. ŚTHĪVANA OR SPITTLE.

Dallana⁶ understands by it—"throwing out expectoration and saliva by the mouth." By this means any foreign body lodged in the oral cavity, such as in the gums, fauces, may easily be got rid of.

¹ दृढा वा इच्छाशस्त्रनिवनस्य तासां पूर्ववदवहोदरेत् ।

Saśruta Saṁhitā, I. xxvii.

² शास्त्रा, इच्छाशास्त्रा, वज्रायाम विनमितायां शास्त्रायां श्लेष्मायभानं दृढं बद्धा, सङ्गसा शास्त्राव्यायेन उच्छ्रितया शास्त्रया श्लेष्ममुत्थियते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

³ अन्ये स्त्रेवं पठन्ति अशकमेवं वा बलवद्भिः सुपरिस्फुटितस्य यन्त्रे सैनं याहयित्वा श्लेष्मावहं प्रविभूज्य धनुर्मुनेर्बद्धेकतःशास्त्रावज्जकटके बध्नीयात् । अथैनम् इत्यत्र कारकेक पाठः कथया ताडयेत् यद्योन्नमयन् शिरोवेगेन श्लेष्ममुद्धरेति, नमितायां पञ्चाङ्गा इच्छाशास्त्रायां च पूर्ववद वहोदरेदिति ॥

Nirandha Saṁgraha, I. xxvii.

⁴ The *Saśruta Saṁhitā*. Bibliotheca Indica. P. 48. foot note 109.

⁵ तद्याप्यशक्ते वारङ्गं वज्रीकृत्य धनुर्जंघा ।

सुबद्धं वज्रकटके बध्नीयात् सुसमाहितः ॥

सुसंयतस्य पञ्चाङ्गा वाजिनः कशायस्य तम् ।

ताडयेदिति मूर्धानं वेगेनोन्नमयन् यथा ॥

उद्धरेच्छ्लेष्ममेवं वा शास्त्रायां कल्पयितरोः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

⁶ छीवर्षं श्रेष्ठादिनिरसनम् ।

Nirandha Saṁgraha, I. vii.

20. PROVĀHANA OR FLUXING THE PATIENT.

This comprises the acts of emesis, purgation and lacrymal secretion. Thus the foreign bodies lodged in the alimentary canal or eyes may be got rid of by causing discharges from the bowels, the stomach, or the eyes¹.

21. HARṢA OR OBJECTS EXCITING HAPPINESS.

Persons suffering from vṛāṇa or wound are directed to have their minds in a state of cheerfulness by the sight of objects exciting happiness². A cheerful man is a better subject for a surgical operation than a morose and gloomy one. Vāgbhaṭa³ adds fear as an accessory instrument. Joy and fear cause a sudden change in the temper of a man and so may be of some help in curing diseases⁴. Suśruta regards, sorrow as a śalya or foreign body which is to be removed by joy.⁵

22. AYASKĀNTA OR LOAD-STONE.

Magnet was known to the ancient Hindus⁶ and they used it

¹ तवागुचव्यूहं कान् मूत्रं पूरीयानिलैः स्त्रमावबलप्रवृत्तैः नयनादिभ्यः पतति ।

Suśruta Sāhita, I, xxvii.

² सुहृदो विचिपन्वाय कथाभिर्ब्रह्मवेदनाः ।

चावासयन्तो बहुशस्तनुकूलाः प्रियम्बदाः ॥

सम्पदायनुकूलाभिः कथामिः प्रीतिनानसः ।

आमावान् व्याधिमोचाय चित्रं सुखमवाप्नुयात् ॥

Suśruta Sāhita, I, xix.

³ See foot-note 1, P. 98.

⁴ भयं हर्षो शरीरस्य सहसा भावान्तरमुत्पादयन्तौ यन्कार्यं कुरुत इति ।

Vāgbhaṭārtha Kaumudī, I, xxv.

⁵ हृद्यवस्थितं मनसि कारणीतुपत्रं शोकशब्दं हर्षेणेति ।

Suśruta Sāhita, I, xxvii.

⁶ मन्थिममनं मूत्रमिसर्पणमदृष्टकारणकं ।

Vaiśeṣikā Darśanam, Ch. V. Āhnikā 15.

to extract minute foreign bodies such as iron particles from the eyes and teeth. Suśruta¹ also mentions its use for extracting an arrow from the wound, if it be without barbs.

In modern times, a magnet is still used for removing a particle of iron from the eye. "Indeed, cases have occurred in which the application of an inch bar-magnet connected with four Grove's cells to the outside of the cornea has caused the foreign body to retrace its course and emerge through the wound"². A fragment of iron lying in the vitreous has been removed by the Snell's electro-magnet introduced through the scleral wound behind the ciliary region. "The following plan of ascertaining whether a portion of needle be really impacted has been suggested by Marshall, and successfully carried into practice by Littlewood of Leeds. A powerful magnet is to be held upon the part for a quarter of an hour, so as to magnetise the fragment; a firmly hung polarised needle should then be suspended over it, when, if any iron is present, deflection will ensue."³

23. Kṣīra. CAUSTICS OR POTENTIAL CAUTERY.

Caustics were highly extolled by the ancient surgeons as the external applications are better tolerated by the weak and

सूक्ष्मसंपर्शमिति सूक्ष्मपदेन लोहमात्रं दृष्टव्योपलक्षयति: तथा चायस्मान्नामिदमुखं
यत् सूक्ष्मादेनंमनं * * * * *

Śaṅkara Miśra, Upaśkāra.

¹ अतुलीमननववदकथंमनस्य ब्रह्ममुखमयस्कान्तेन ।

Suśruta Saṁhita, I. xxvii.

² Carter's Ophthalmic Surgery, 2nd ed., P. 369.

³ Erichsen's Surgery, Vol. I, P. 343.

timid persons who are afraid of the surgeon's knife¹; though Suśruta² distinctly states: "The following persons should not be treated with caustics: weak people, children, old and timid people, etc." They even give them preference to the knife for they argue that surgical diseases are radically cured by the application of the caustics, without any possibility of recurrence. Suśruta says³: "Of all cutting instruments and their substitutes, caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions and scarifications may be made, derangements of the three humours may be rectified and some diseases can be treated with special advantage."⁴

For the preparation and uses of caustics, see the Suśruta Saṁhitā, I. xi.

For the application of potential cauteries, three classes of instruments are recommended.⁵

1. Darvī—it is to be made of wood and should resemble a spoon in appearance.

¹ अल्पसत्वेऽवले बाले पाके चातर्था मुञ्चते ।

दारवं मर्मे सम्यादिस्थिते चाप्यत्र पाटनं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxix.

² अघनेने चारुहत्याः । तदाद्या दुर्बलबाल स्त्रियि भौरुमर्माङ्ग यूनोदरि रक्तपित्त-
वाभिन्त्युत्तमौ प्रहृष्टहृदि प्रमेहोरः अतचीनवत्वा सूक्ष्मोपद्रुतजीवापहतोद्भूत फलयोगवः ॥

Suśruta Saṁhitā, I. xi.

³ शस्त्रानुश्लेषः चारः प्रधानतमच्छेदमेघश्लेष्म करणाविदोषघ्ननादिशेषक्रियात्रचारणाच्च ।

Suśruta Saṁhitā, I. xi.

⁴ Ibid. Hoernle's Trans. Bibliotheca Indica.

⁵ आस्राद्य च दर्शिकृच्च शलाकानामन्यतमेन चारं पातयेत् ।

Suśruta Saṁhitā, IV. vi.

2. Śalākā or rods,—plain probes are mentioned for application of caustic lotions to parts of the body. But generally the ends of the probes are shaped like spoon. To this class belongs the three spoon-like probes of Suśruta and the three nail-shaped probes of Vāgbhaṭa, described before¹.

3. Kūreca,—it is a brush-like instrument.

The application of caustics has its advantages and disadvantages; and these are to be considered in their relations to the pre-anæsthetic periods of surgery. Patients are still less terrified by their application than by surgical incisions. The real value of caustics is thus summed up by Velpeau.² "Nevertheless caustics possess some advantages which can not be denied them. As they do not give the idea of an operation, they shake less the minds of the patients, they are accepted with more calmness and with infinitely less effort, than the action of the knife. Mortifying the tissues step by step, they give rise to no effusion of blood, and affect less deeply the economy than the operation, properly so called. Women treated in this way do not require to remain in bed or to consider themselves as patients. The dressings require little care, and do not demand absolutely the intervention of the surgeon. The wound cleans itself very rapidly in general, and once cleaned, it proceeds speedily towards cicatrisation. Without exempting wholly erysipelas, phlebitis or purulent infection as some surgeons have asserted, there is notwithstanding, some reason for supposing that they expose the patient somewhat less to these troublesome complications than the operation".

¹ See P. 158-159.

² Velpeau. Cancer of the breast. Marsden's trans.

25. AGNI. ACTUAL CAUTERY.

Suśruta says¹: "With regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not re-appear, and because it can cure diseases which are incurable by medicines instruments, and caustics."² This partiality for cauteries is one of the reasons of the gradual decadence of Hindu surgery and its total extinction in the present time. To this belief of the Hindus may be compared the following aphorism of Hippocrates³:—

"Those diseases which medicine do not cure, the knife cures; those which iron can not cure, fire cures; and those which fire can not cure, are to be reckoned wholly incurable".

For the application of the actual cautery the following articles are considered necessary⁴:—

- | | |
|--|--|
| 1. Pippali or piper longum | } These are to be used for diseases of the skin. |
| 2. Goat's dung | |
| 3. Teeth of a cow | |
| 4. Śara or saccharum sara | |
| 5. Probes or śalākā (see before ⁵) | |

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यातस्तद्गन्धानां रोगानां संपुष्पं भावाद्देवजगत्प्रसारैरसाध्यानां तन्मात्रवत्वाच्च ।

² Ibid. Hoernle's Trans. Biblio. Ind.

Suśruta Samhitā, I. xii.

³ The Works of Hippocrates. Syd. Soc., vol. II., p. 774.

⁴ अग्निमानि दहनोपकरणानि । तद्यथा पिप्पल्यजाम्बूद्वीदं शरशलाका जाम्बवीदितरजीहाः शीतगुडश्चेहाय । ततः पिप्पल्यजाम्बूद्वीदं शरशलाकासङ्गतानां । जाम्बवीद्वीदं तरजीहानि सांस्रमत्तानां शीतगुडश्चेहाः शिरसायुः सन्ध्यस्त्रिगतानां ।

⁵ See P. 159-60.

Suśruta Samhitā, I. xii.

- | | | |
|------------------------------|---|---|
| 6. Jāmvavausṭha ¹ | } | Used for diseases of the muscles. |
| 7. Different kinds of iron | | |
| 8. Honey ² | } | Used for diseases of the vessels, joints and ligaments. |
| 9. Treacle | | |
| 10. Ghee | | |
| 11. Oil | | |

"Both Aetius and Oribasius represent goat's dung, pounded with vinegar, as being equally efficacious as the sinapism, and applying particularly to ischiatic diseases."³ Hippocrates says that cauterisation may be performed with boxwood spindles dipped in boiling oil.⁴ In Kordofan, are used "*El kamaia*, primitive instruments used for cauterisation consisting of a piece of camel's or sheep's dung dried and impaled on a long thorn."⁵

12. Cautery knife.—This is to be used in the treatment of prolapse of the omentum in cases of abdominal injuries. The

¹ अथो भगन्दरयन्त्रिणाङ्गीदृष्टव्यादिषु ।

मांसदाहो मधुमेह जाम्बवीट गुहादिभिः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxx.

² मधुच्छिटेन तैलेन मज्जचीद्वयसाहते ।

तत्रैवा विविषेत्तौ वैदं हृद्वाह विमेषयित् ॥

Caraka Saṁhitā, VI. xiii.

³ Adams' Commentary on Paul. vol. iii. bk. vii. sec. xix.

⁴ Hippocrates, ii. 482.

⁵ Medical Practices in Kordofan, Third Report. Wellcome Research Laboratory, Khartoum.

prolapsed part is to be ligatured well and the cautery knife used to remove the prolapse below the ligature¹.

Cautery knife was also known to the Greeks and Romans. Galen², speaking of cancer, says that "some use heated razor blades, at once cutting and burning". Paul³ also mentions a sword shaped cautery in the radical cure of hydrocele.

13. Plates of copper, lead or iron.—In the application of both kinds of cauteries, plates of these metals are to be used to surround a tumour to prevent injury to the adjacent structures (Suśruta).⁴

Hippocrates⁵ in the treatment of nasal polypus, says that "when that occurs we must insert a tube and cauterise with three or four irons". Celsus⁶ says that this tube may be a calamus or a tube of pottery.

14. Cakradatta mentions a probe of gold for applying actual cautery to the hair follicles after the removal of the eyelashes, to prevent a recurrence of trichiasis.⁷

Albucasis similarly recommends burning the roots of hairs

¹ छदरान्मेदसो वर्णिर्निगता यस्य देहिनः ।

कषायभक्षसङ्कीर्णो बहो मूत्रेण रुचक्ति ।

अग्निदेन यस्मिन्किन्द्यान्धुसमायुतं ॥

Suśruta Saṁhitā, IV, ii.

² Galen, xiv. 786.

³ Paul, vi. lxii.

⁴ यदल्पमूलं वपुतामसोऽपि पट्टः समावेष्टा तदाद्यसौर्ज्वा ।

आराग्रिभस्त्राण्यसृजद्विदध्यात् प्राणानहिंसन् भिषग्प्रमत्तः ॥

Suśruta Saṁhitā, IV, xlii.

⁵ Hippocrates, ii. 244.

⁶ Celsus, vii. x.

⁷ See foot-note 2, p. 63.

in trichiasis with a probe of gold. Paul¹ applies a heated olivary probe or an aural probe for the same purpose. Haly Abbas and Rhazes also describe this operation.

26. BHEṢAJA OR MEDICINES.

This means such medicines as become necessary in the treatment of surgical diseases and do the work of surgical instruments to a certain extent. Suśruta gives a list of medicines,² required in the treatment of various kinds of inflammations, and I quote a few passages from the English translation³ to illustrate the action of medicines in surgical practice. "Warm poultices made of the following drugs promote suppuration, namely, fruits of *sana* (*Crotalaria juncea*), *Mūlaka* (*Raphanus sativus*), *Śigru* (*Moringa pterygosperma*), seasum and mustard seeds, flour of barley and wheat, *kiṇva* (the drugs used as a ferment in distilling spirits) and linseed. The following medicines are applied for opening abscesses, namely, *chiravilva* (*Pongamia glabra*), *agnika* (*Semicarpus anacardium*), *chitraka* (*Plumbago Zeylanica*), *danti* (*Baliopermum montanum*), *hayamāraka* (*Nerium odorum*), and the excrement of the pigeon, vulture and heron. Caustic alkalies are also very effectual in opening abscesses. Demulcent articles, such as, flour of barley, wheat or *māsha* (pulse of *Phaseolus Rox.*) promote discharge from the interior of abscesses. * * * * Pastils for fumigating ulcers should be made of *śrīceśhtāṭka* gum of (*Boissellia Thurifera*), *śarjarasa* (resin of *Shorea robusta*), *sarala* (*Pinna longifolia*), and *devadāru* (*Cedrus*

¹ Paul viii. xiii.

² See Suśruta Saṁhitā, I. xxvi.

³ Dr. U. C. Dutt's Translation, Bibliotheca Indica, P. 151-154.

deodara); decoctions or cold infusions of astringent and unirritating barks should be used as washes for promoting granulations in ulcer. Tents for promoting granulations should be made of *soma* (*Sarcostemma brevistigma*), *amṛita* (*Cocculus cordifolius*), *aśvagandhā* (*Withania somnifera*), the plants included under the class of *kākoladyādi*, and the buds of (*Ficus Bengalensis*)".

In treating inflammation, the Hindu surgeons used pastes to give relief to the pain and tension; warm poultices to promote suppuration; medicinal applications and incisions by knife for opening abscesses; demulcent articles to promote discharges; decoctions of drugs as corrective washes; tents of drugs and lint for introducing them into the cavities of the abscesses; decoctions in oils and clarified butter to improve the character of ulcers; pastils for fumigating sores; tents, pastes, powders and lotions for promoting granulations; drugs to repress high granulations; drainage to prevent infection, and bandages to give the part rest. This shows that the Hindus were not wholly ignorant of the antiseptic methods of treating wounds; and Suśruta enjoins that a certain incense should be kept burning in the operation room.

Of the additions to the list of Suśruta by Vāgbhaṭa, we need consider the goat's gut only.

GOAT'S GUT.

The intestines of the goats, etc. are to be dried and prepared as materials of ligature¹. They should be used in ligaturing fine vessels after incision by knife, evidently to check hæmorrhage.

¹ See foot note 1, P. 223.

The use of goat's gut in surgery is generally considered to have been unknown to the Greeks and Romans, as it is not mentioned in their works. But Adams points out¹ "that the strings of ancient harp were made of the guts of a sheep," and this he clearly proves from a passage in the *Odyssey* of Homer.

Hippocrates² used apolinose made of crude flax, which is also mentioned by Paul for the delegation of arteries. Rhases however describes the use of strings of harp³ as a material for suture in the operation called *gastrographé*.

ARREST OF HÆMORRHAGE.

It is generally believed and often stated in modern works on surgery that the ancients were unacquainted with the proper treatment of hæmorrhage. Suśruta however enumerates four different ways of arresting hæmorrhage after venesection; namely:

1. Sandhāna :—Contraction of the wound by astringent decoctions of Chebulic Myrobolan and the root-barks of the panchavalkala trees (five barks).
2. Skandana :—or thickening of the blood by the application of severe cold.
3. Pāchana :—or descicating or drying up the wound by ashes.
4. Dahana :—or cauterising the veins to make them shrink⁴.

¹ See Commentary on Paul, VI. iii. vol. II, P. 345. Syd. Soc. Ed.

² Hippocrates, iii. 132.

³ Rhases. Cont. xxviii.

⁴ चतुर्विधं यद्विद्वि बधिरस्य निवारणं ।

सन्धानं स्कन्दनञ्चैव पाचनं दहनं तथा ।

If the blood does not thicken by the application of cold, astringents should be applied; if these fail ashes should be used. By means of these three modes, the physician should endeavour to the best of his abilities to stop the bleeding, but if success be not still obtained, cautery may be resorted to as the absolute effective means¹. To stop bleeding from an artery, he advises us to apply astringents and pressure with the fingers. Vāgbhaṭa² also describes these methods of arresting hæmorrhage, and advises us that if the ordinary means do not check the bleeding, the vessel must be again opened at a point in its course beyond the bleeding area, or actual cautery applied. Cakradatta also repeats these directions³.

Vāgbhaṭa however mentions the sheep's gut amongst the accessory instruments. His commentator explains its use for

वृषः कषायः सन्धत्ते रक्तं कन्दयते हिमं ।

तथा सन्धाचयेदथ दाहः सङ्कोचयेत् सिराः ॥

Suśruta Saṁhitā, I. xiv.

¹ अलक्ष्मदमाने रुधिरं सन्धानानि प्रयोजयेत् ।

सन्धाने श्लेष्मदमाने तु पाचनेः सुप्तप्रचरित् ॥

कल्मेरेतैस्त्रिभिर्वेद्यः प्रयतेत यथाविधि ।

अग्निहिमन्तुषु चैतेषु दाहः परमं दध्यते ॥

Ibid.

² रक्ते त्वतिष्ठति क्षिप्रं सन्धजीमाचरेत् क्रियान् ।

श्लोषं म्रियद्वा पतद्वा साधयत्याह गोरिकैः ॥

सक्तकपालाघ्ननवीमं नवीं चौरौत्वगद्वरेः ।

विचूर्णयेद् वृषसुखं पद्मकादि हिमं पिबेत् ॥

तामेव वा शिरां विध्येद्वाधात् तत्पादनन्तरं ।

शिरामुखं वा त्वरितं दहेत् ततश्चलाकया ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ See Cakradatta, *Śiśāvyūdhādihikāra*.

ligaturing blood-vessels¹. Suśruta says that if in venesection, or in treating wounds, excessive bleeding occurs, it should be stopped by proper means².

Celsus³ advises us to fill up the wound with dry pledgets, then to apply a sponge squeezed out of cold water and to press with the hand. If not successful, cut the vessel asunder between two ligatures, or apply cantery, or try the method of revulsion. Galen⁴ applies pressure by finger on the wounded vessel, or twists it moderately. If the vessel be an artery, he gives the alternative of a ligature or cutting across. Paul⁵ mentions all the methods to stop the bleeding, *viz.*, pressure, styptics, ligature, escharotics, and cauteries with fire.

Albucasis⁶ mentions four methods of stopping the discharge of blood from an artery :

1. By cantery.
2. By dividing the artery across.
3. By using the ligature.
4. By styptics and bandage.

Avicenna⁷, Rhases⁸ and others also mention these methods

¹ अर्धं मेधादीनां सुक्लानां तद्वत्कृत्वा तं मज्जाच्छेदानन्तरं सूक्ष्मसिरादिवन्धनादिषु युज्यते ।

Vāgbhaṭārtha Kaṇmudī, I. xxv.

² वेधेर्विभिन्नैर्वपुषा शोणिते प्रसृते चम् ।

आज्ये यद्योक्तं वैद्येन शोणितस्त्रापनं भवेत् ॥

Suśruta Saṁhitā, IV. 4.

³ Celsus, v. 26.

⁴ Galen, Meth. Med. v.

⁵ Paulus Ægineta, IV. lii. vol. II, P. 127. Syd. Soc. Ed.

⁶ Albucasis. Chirrug. i. 58.

⁷ Avicenna Cantic. ii. 2, and Collig. vii. 23.

⁸ Rhases. Divis i. 39; Contin. xxviii.

for arresting hæmorrhage. Thus it becomes apparent that the use of ligature for stopping bleeding was well known to the ancient surgeons and the present methods of arresting bleeding are only the revival of the old practice. Adams¹ concludes: "It appears, therefore, that the use of the ligature for stopping hemorrhages was well understood by the ancients, and had never been lost sight of even in the darkest ages."

¹ Adam's Commentary on Paul, vol. II. p. 132.

CHAPTER VI.

THE ŚĀSTRA OR THE SHARP INSTRUMENTS.

1. THE MAṆḌALĀGRA OR ROUND HEADED KNIFE.

It is described as a round or circular headed cutting instrument, having a length of six aṅguli. Two sub-varieties are noted—one with a circular edge and the other shaped like a razor (Dallāṇa).¹ Vāgbhaṭa², however, describes the blade to be shaped like the index finger when its nail points towards the palm of the hand. This would then resemble the decapitating hook of Ramsbotham.

It is said to have been principally used for the operation of cutting through and scraping³; so it is recommended to be used

¹ मण्डलनिर्वाणं यस्य तत् मण्डलाग्रं तच्च द्विविधम् तद्यथा—

यदग्रे मण्डलं इतं चुर संस्थानमेव वा ।

मण्डलाग्रस्य जानीयात् प्रमाणानु धङ्गलम् ।

Nivandha Saṁgraha, viii.

² मण्डलाग्रं फले तथा तर्जन्यनर्नखाकृति ।

लेखने छेदने योज्यं पोषकौ शुष्किकरदिषु ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

मण्डलाग्रं, मण्डलाग्रं नाम शस्त्रं, फले, फल प्रदेशे, तर्जन्यनर्नखाकृति स्यात्, अन्तः, अन्तर्हितो मुखः, अन्तर्मुखः, तर्जन्या अन्तर्मुखः, तर्जन्यनर्नखाकृति राकारो यस्य तत् तर्जन्यनर्नखाकृति । तत्र पोषकौ मलशुष्किकादिषु, लेखने, लेखन कर्मणि, तथा छेदने, छेदन कर्मणि, योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

फलोद्देशे तर्जन्या अन्तर्मुखतर्जन्यनर्नखाकृतितिर्यस्य तद्वत् ।

Sarvāṅga Sundarī, I. xxvi.

³ तत्र मण्डलाग्रकरणे स्थातो छेदने लेखने च ।

Sūratra Saṁhitā, I. viii.

in the operative treatment of enlarged tonsil¹. It is also advised to be used for piercing the skull of a dead foetus in utero to help its easy extraction by other instruments. So any other presenting part causing difficulty in the delivery of the dead foetus, is to be cut with it. It is claimed that there is less likelihood of damaging the soft parts of the mother by this instrument than by the sharp pointed *vrddhipatra*.²

We find that *Suśruta* recommends a *maṇḍalāgra* knife in ophthalmic practice for scraping away the membranous expansion in the operation of pterygium³ and other ophthalmic operations,

¹ षड्हातुविमन्दं शैनाकस्य गलयन्त्रिकां ।

क्षेदयेन्मण्डलाग्रं च जिह्वोपरि तु संस्थिताम् ।

नौत्कटश्चैव ह्रीनश्च विभानं क्षेदयेद्विषक् ॥

Suśruta Saṁhitā, IV. xxii.

* तत्र स्त्रियमाश्रमा मण्डलाग्रं षाट्हातुं शस्त्रेण वा शिरो विदार्य शिरःकपालान्वाहृत्य षड्हातुं मण्डलीतीरसि कक्षायां व्यपहरेदभिन्नशिरसि चाविकृष्टे गच्छेत् वा चंसंसंस्कृष्टांसद्वये षाट्हातुं हिला इतिमिवाततं वातपूषोदिरं वा विदार्य निरस्यान्वाशि शिदिलीभूत माहरेज्जघनसङ्गस्य वा जघनकपालानौति ।

यद्, यद्वद् द्वि गर्भस्य तस्य स्रजति तद्विषक् ।

सुष्यन्निर्द्धरेच्छिला रक्षेत्रारीश्च यवतः ।

गर्भस्य गतयश्चिता जायन्तेऽनिलकोपतः ।

तच्चानास्मतिर्ज्वयो वचो त विधिपूर्वकं ॥

नोपेक्षत सतं गर्भं मूहुर्न मपि पश्चितः ।

सञ्चायुःजननीं हन्ति निरुच्छासं पशुं यथा ॥

मण्डलाग्रं च कर्तुं त्वं क्षेप्यमन्त्रिजानता ।

इतिप्रवन् द्वि तौचायं नारीं हिंस्यात् कदाचन ।

Ibid, IV. xv.

¹ यन्मं यव वलीजार्तं तवै तज्जगयद् भिषक् ॥

अपाट् प्रे चमाश्चस्य वडिशेन समाहितः ।

मुपुच्छाम्पृष्ट मेषावौ मूषीमूलेष वा पुनः ॥

नचोभ्यापयता चिप्रं कार्यमभ्युद्यतं तु तत् ।

such as for vascular net-work and nodules on the eyeball¹. Cakradatta says² that if the pterygium extends to the black part of the eye, the membrane is to be raised by the point of a needle, transfixed by a vajiśa or hook, and leaving the pupil free, is to be excised, as Sivadāsa³ explains, by the maṇḍalāgra. He also uses it to scrape away the root of any new growth in the eye⁴ and to perform the operation of scratching in ophthalmic surgery⁵.

शस्त्रपातभयाद्वासा वक्ष नी याद्वेदं हृदं ॥
 ततः प्रविशिलीभूतं विभिरेष विलम्बितं ।
 उल्लिखेन्द्रगुलायेणः तौल्येन परिशोधयेत् ॥
 विमुक्तं सर्वतश्चापि कृच्छाच्छृङ्गाय मण्डलात् ।
 नीत्वा कर्नौनकोपान्ते द्विन्द्यान्नाति कर्नौनकं ॥
 चतुर्भागस्थिते मांसे नाचि व्यपलिमर्हति ।

Suśruta Saṁhitā, VI. xv.

- ¹ सिराजाली सिरायास्तु कठिनामाद्य बुधिमान् ।
 उल्लिखेन्द्रगुलायेण वङ्किमेनावलम्बितः ॥
 सिरासु पिङ्गकाजानां या न सिध्यन्ति मेघजैः ।
 अर्धवन्द्यगुलायेण तामाच्छेदनमियते ॥

Ibid.

- ² अर्धं तु च्छेदनीयं स्यात् कृच्छपाते भवेद्वयदा ।
 वङ्किमविहमुग्रस्य विभागश्चात्र वर्जयेत् ॥

Cakradatta, Netraroga Cikitsā.

³ अर्धच्छेदनीयमिति मण्डलायेणेति श्रेयः । समुग्रमेति सूक्ष्मयेति श्रेयः । सूक्ष्मेण समुग्रस्य उत्तौल्य अननरं वङ्किशेन विहा मण्डलायेण छेदयेदित्यर्थः ।

Tattva Candrikā, Netraroga Cikitsā.

- ⁴ अर्धस्यैवावर्तनाया यथाशोऽन्वन्दमेव च ।
 मण्डलायेण तौल्येण मूलेच्छिन्द्याद भिषक् शनैः ॥

Cakradatta, Netraroga Cikitsā.

- ⁵ भिलोपनाहं कफजं पिप्पली मधुसैन्धवैः ।
 विलिखेन्द्रगुलायेण प्रक्षयेद्वा समन्ततः ॥

• • • • •

A small instrument with a broad blade and a rounded cutting tip is figured by Albucasis¹ in connection with ophthalmic work. This was the scalpel for the plastic operation on the eyelid as for trichiasis. Incisions were made by this knife on the eyelids in such a way as to enclose a leaf-shaped area which was then dissected off. The lips of the incisions were then united with three or four sutures². Paul³, quoting Aetius⁴, describes the operation for pterygia :—" Having separated the eyelids, and seized upon the pterygia with a hook-like instrument, having a small curvature, we stretch it, and taking a needle having a horse-hair and a strong flaxen thread in its ear (eye ?), and a little bent at the extremity, we transfix it through the middle of the pterygium, and with the thread we bind the pterygium and raise it upwards, while with the hair we separate and saw as it were the part at the pupil away unto its extremity ; but the remainder of it at the great canthus we cut off from the base with the scalpel used for the operation by suture, but leaving the natural flesh of the canthus, lest there be a running of the eye when it is taken away. Some stretching as aforesaid with a thread, dissect away the whole pterygium with the instrument called pterygotomos, taking care not to touch the corner."

Cakradatta mentions the use of the maṇḍalāgra for scarifying

घृतसैन्धव चूर्णेन कफलाहं पुनः पुनः ।

विलिखिन्मण्डलाग्रेण प्रच्छयेद्वा समस्ततः ॥

Cakradatta, Netraroga Cikitsā.

¹ Milne. *Greco-Roman Surgical Instruments*, Pl. ix. fig. 3.

² Paulus Aegineta, VI. viii.

³ Ibid., VI. xviii.

⁴ Aetius, II. iii. 60.

the tongue for bleeding in the disease called *jihvākantaka* (prickly tongue)¹. He also uses it in *adhijihvā* or *ranula* and says: "The tongue is to be raised, the ranula is to be drawn up and fixed by a sharp hook, and then excised by the *maṇḍalāgra*. Afterwards a strong gargle is to be prescribed".² *Pālakāpya*³ also describes it to have a length of nine *aṅguli*, the handle being six, and the blade three *aṅguli* long. The end is full-moon-shaped and it is directed to be used for scarification on the eyeball.

It seems that *maṇḍalāgra* of different sizes and shapes were used. For the instrument used for perforating the foetal cranium in uterus would scarcely be thought fit for a delicate operation on the eyeball.

Soranus⁴ mentions a special instrument for perforating the foetal head. Rhases⁵ directs us to open the head when the child's cranium is large and cannot be brought down. Haly

¹ कण्ठकेषु कफोत्थेषु लिखितेष्वसजः चये ।

विषल्यादिर्मधुदुतः कर्ष्यन्तु प्रतिसारणम् ॥

Cakradatta, Jihvārōga Cikitsā.

लिखितेष्विति मण्डलायादिना ।

Tattva Candrikā, Ibid.

² उग्राम्बु निघ्नमाकृष्य वडिशिनापिनिद्रिकाम् ।

हेदयेन्द्रमण्डलायेण सीष्णोष्णैर्लवणादिभिः ॥

Cakradatta, Mukharoga Cikitsā.

³ लिखनं मण्डलाप्रेषणं कर्तव्यं दन्तिनां भवेत् ।

Pālakāpya, III. i.

पूषेचन्द्राकृत्यायमण्डलायम् लिखनार्धमक्षौ ।

Pālakāpya, III. iii.

⁴ Soranus, II. viii., P. 366.

⁵ Rhases, Cont. xxii.

Abbas¹ also advises us to open the head when it is preternaturally large. Aetius² also gives a similar description. Some authors recommend the polypus-scalpel or the phlebotome in embryotomy. The embryotome figured by Albucasis³ is a straight two-edged blade, and we may conjecture that the *maṇḍalāgra* used by the Hindus for perforating the foetal cranium was a similar instrument.

2. KARAPATRA OR SAW.

It literally means, "an instrument having the blade in the form of a hand", the fingers being represented by the teeth of the saw. Others explain, as Dallana⁴ points out, the name from its resemblance to a carpenter's saw. It seems that saws of various sizes were used. *Suśruta* mentions its length to be six *aṅguli*, *Vāgbhaṭa*⁵ describes it to be ten *aṅguli*

¹ Haly Abbas, Pract. ix. 57.

² Aetius, XVI. 23.

³ Graeco-Roman Surgical Instruments, Pl. viii. fig. 7.

* करपत्रमिति करवत् पत्रं करपत्रं यथा करोऽङ्गुलिभिराचितो भवति तद्वत् यत् कण्टकैराचितं स्यात् करपत्रमुच्यते । अन्ये तु करपत्रशब्दं करपत्राकारमेव तच्च द्वादशाङ्गुलं तन्नामर वचनात् । ननु यदि तन्नामरात्तद् द्वादशाङ्गुलं करपत्रमुच्यते तर्हि स्रतन्ने विरोधः कुतः स्रतन्ने करपत्रस्य निर्दिष्टप्रमाणात् शेषानि तु षडङ्गुलानि इत्यनेन वाक्येन षडाङ्गुलमेव करपत्रम् स्यात् द्वादशाङ्गुलं नैवम् तेषाम् नामाभिरुक्तयः प्रायेण व्याख्याता इत्यस्यात् सूत्रात् प्रायः शब्दोऽनुवर्ततेतेनावसर्गं, शेषानि प्रायेण षडङ्गुलानि एवं शस्त्रमानैः न्यायाच्चिरोधः ।

Nivandha Saṁgraha, I. viii.

* छिदिऽङ्गुं करपत्रेण खरधारं दशाङ्गुलं ।

विस्तारं द्वादशाङ्गुलं सूक्ष्मदन्तं सूत्रस्य वचनम् ॥

Aṣṭāṅgā Hṛdaya Saṁhitā, I. xxvi.

करपत्राख्यां शास्त्रमाह छिदि इत्यादि करवत् पत्रं यथा तत् करपत्रं अङ्गुलिभिराचितो यथाकारो भवति तद्वत् यत् कण्टकैराचितं तत् करपत्रमुच्यते । करपत्रं करात् स्यात् । करपत्रं खरधारं, खरा, तीक्षा, धारा यथा तत्तथाविधम्, तथा दशाङ्गुलम्,

long and two *añguli* broad; while Bhoja¹ alludes to a saw, twelve *añguli* long. The edge of the instrument is described as rough and serrated; and this is the only instrument that need not have a very sharp edge.

The handle of the saw should be well formed and pegged. Its principal use is to saw a bone. Sometime it is recommended for the purpose of scraping.

Saw is frequently mentioned by the Greek and Roman authors in the descriptions of operations on the bones. Celsus² mentions it in describing the amputation of a gangrenous limb. With reference to fractures of the bones of the head, Paul says³: "But the mode of operating with saws and the instrument called *cheenicides* or *modioli* (trepan?) is condemned by the moderns as a bad one." Evidently he means flat cranial saws. Galen⁴ also mentions the "knife-shaped saws."

In modern times the saw is still used for identical purposes in surgery.

There is no mention of trephine in Hindu surgery though Jīvaka (500 B.C.) is said to have practised cranial surgery with success⁵. Pandit Vallala describes⁶, in his *Bhojaprabandha* or

देव्यं दशङ्गुल परिमाणं, तवा विलारि द्वाङ्गुलं, परिसरे षड्गुलव्यपरिमितं तवा दृक्
दलं मुख्या दलाकारा दलं यस्य तत्तथाविधं, तवा स्रत्सरवन्धनं, तसर खड्गादि मुष्टिः
वन्धनं, कौलादिना वन्धनं, तसरश्च वन्धनञ्च ते तसर वन्धने, शोभने तसर वन्धने यस्य तत्तथा-
विधं । तच्च अस्यां छिदे, छिदनं कर्त्तव्यं योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

¹ See foot-note 4, P. 230.

² Celsus, VII. xxxiii.

³ Paul, VI. xc.

⁴ Galen, XVIII. 331.

⁵ See *Mahāvāgga*, VIII. 1.18. *Sacred Books of the East*. Vol. xvii.

⁶ See foot-note 1, p. 60.

Anecdotes of King Bhoja, a surgical operation performed on the king. He was suffering from a severe pain in the head. Medicines did him no good, and so to give relief, surgical interference was thought necessary by two brother surgeons who happened to arrive in Dhar at that time. They are said to have administered a drug called *summohinī* to render him insensible. They then trepanned the skull and removed the real cause of his complaint. They closed the opening, stitched the wound and applied a healing balm. They are then said to have administered to the king another drug called *sañjibanī* to accelerate the return of consciousness.

Trephine was well known to the ancient Greeks and Romans. Hippocrates¹ mentions a trephine or a saw having a circular motion, in the treatment of injuries to the head. Paul also mentions trephine, the use of which is, he says, condemned by the moderns. Sprengel² remarks, that "Galen was averse to the use of the trepan, though he performed the operation on the head occasionally."³

3. VṚDDHIPATEA.

This sharp cutting instrument is called *vṛddhipatra* from its resemblance to the leaf of a medicinal plant called *vṛddhi*. Two varieties of this knife are described by *Vāgbhaṭa*⁴—one is

¹ Hippocrates, III. 371, 374.

² Hist. de la Méd., 18.

³ Adam's Commentary on Paul, VI, xc. Vol. ii., p. 436.

⁴ इद्धिपत्रं चुराकारं छेद भेदन पाटने ।

अन्वयमुच्यते शोफ गन्धारे तु तदन्यथा ।

नतान् पृष्ठतो दीर्घं इस्त्रवक्कं वशावधं ॥

straight throughout and it is to be used for opening pointed superficial abscesses; and the other has the end bent or curved. Again amongst the second class of curved knives, some have their ends long and therefore called *dirgha-vaktra* or long-mouthed, and these are to be used for opening the deep seated abscesses, while others have their ends short and therefore called *hrasva-vaktra* or short-mouthed, and these are to be used for superficial abscesses that would not point. *Suśruta* describes them to be six *aṅguli* long. *Dallaṇa* in his commentary¹ says:—Both the varieties, one with a curved,—and this is called a *kṣura* or razor,—and the other with a resected point, should be seven *aṅguli* long; the handles and the blades should measure five and a half and one and a half *aṅguli* respectively.” These are to be used for cutting through a part, partially or completely, and also for puncturing it.

इतिपवाण्यां शस्त्रमाह इतिपवन्त्यादि इतिपवं नाम शस्त्रं, चुराकारं, चुराकृति, चुरश्च श्लोमश्लेदकः शस्त्रविशेषो नरमुन्दरायोः । तत्र इतिनामीषध इच्छन् पलमहम फलक वात् इतिपवाण्यं लभते । तद् इतिपवं नाम शस्त्रं वेदे भेदने पाटने च कार्यंषि योज्यमिति चरन्त्यमिन्यादिना विषय विशेषे इति पलस्त्राकार भेद उच्यते । यत् इतिपवं चरन्त्यं सरलायमाणं, आपतायमिष्यः । तत्, उन्नते, उच्छिन्ने, शोके, मोये, योज्यं । गन्धोरे, भेद आदि धातुष्ये शोके, तथा तदन्यथा, अनुव्रते च शोके, यत् पृष्ठतः, पृष्ठदेशे नतायं वक्षोभूतायमाणं, कुक्षितायमित्यर्थः । तत् इतिपवं शस्त्रं यथायथं दीर्घं क्लृप्तं चक्रं, दीर्घं मुखं, क्लृप्तं मुखं वा योज्यं । यथायथमिति गन्धोरे शोके दीर्घचक्रं, अनुव्रते च शोके क्लृप्तचक्रमित्यर्थः । अत इतिविधं इतिपव शस्त्रयुक्तम्, हे अपि सप्ताङ्गुल प्रमाणे, इयोरपि अर्धपञ्चाङ्गुल इत्यं कार्यं साप्ताङ्गुल्यं फलमिति । भेदनं, भेदं, एकस्मिन् शरीरदेशे शस्त्रमाववाह्य अपर दिशा शस्त्रावस्य निष्काशनं भेदनं । पाटनं, विदारणं काङ्क्ष इति श्लोके ।

Vāghhaṭāṛtha Kanmudī, I. xvi.

¹ इतिपवमिति, इहेः पचमिव इतिपवं तत्र इतिविधं एकं अक्षितारं, द्वितीयं प्रयत्नारं, हे अपि सप्ताङ्गुल प्रमाणे इयोरपि अर्ध पञ्चाङ्गुलं इत्यं कार्ये साप्ताङ्गुलम् फलम् इति अनयोन्मथ्ये अक्षितारं इतिपवं चुरमाहुः ।

Nivandha Samgraha, I. viii.

One form of the *vṛddhipatra* resembles in shape the razor used by the barbers,—not the English razor that has now become common in Bengal, but the country-made razors which are still used by the barbers in the North-West Provinces.

Suśruta recommends the use of razor, scissors and pinchers for shaving the parts before operation; for “the hairs”, he says, “prevent the healing up of the wound rapidly”¹. He again uses *vṛddhipatra* as a knife and observes:—“If bitten by spiders whose bites are amenable to treatment, the area of the wound should at once be excised out by the *vṛddhipatra*, and then actual cautery applied by the red-hot *jāmvavausṭha* probe till the patient requests for its withdrawal”².

Suśruta uses the *vṛddhipatra* knife for the removal of the scrotal tumour and says³: “The scrotal tumour is to be well fomented and bandaged. The patient should then be cheered up, and leaving the testicles intact, underneath the *melian raphe*, the tumour should be excised by *vṛddhipatra* knife. The fatty tissues being

¹ रामाकीर्णो ब्रणो यस्तु न सम्यगुपरीहति ।
चुरकर्मरौमन्दमे क्षस्यारौनाणि निर्हरेत् ॥

Suśruta Saṁhitā, IV. i.

² साध्याभिराभिलुताभिर्दष्टमावस्य दिहिनः ।
इहिपथेन मतिनान् सम्यगादयमुद्धरेत् ॥
जाम्बहेनाग्नि तप्तेन दष्टेदाकर वारणात् ।

Ibid, V. viii.

³ सिक्वां चावेष्टा पश्चिम समाश्रयात् मानवं ।
रक्षेत् फले सेवनीय इहिपथेन दारयेत् ॥
मेदस्ततः समुद्भूय दद्यात् क्षासीमसेन्धवे ।
बभ्रूयाश्च यथोद्दिष्टं ।

Ibid, IV. xix

removed, powdered ferri sulphas and rock salt are to be dusted over the wound and proper bandages applied."

Vṛddhipatra was also used by the ancient veterinary surgeons. Joyadatta Suri writes¹: "The knife known as vṛddhipatra is shaped like a kṣura or razor. It is three aṅguli long and should be used by the wise to incise a suppurated abscess". In Pālākāpya², we find that "it is ten aṅguli long; the handle being six aṅguli and the blade four aṅguli long and three aṅguli broad. It is used for seission and excision". He uses it also in opening a sinus after well ascertaining its course by means of a probe³.

Hypodermic medication:—The use of hypodermic syringe was not known to the Hindus. They were acquainted however with the hypodermic method of exhibition of drugs. Śārṅgadharma⁴

¹ दाहूलं वृद्धिपत्रं क्षुराकारं प्रकीर्तितम् ।

पक्ष्मशोषादिषु प्राग्ः पाटने तेन कारयेत् ॥

Aśvavaidyaka, XIV. v. 22.

² यस्मिन् वृद्धिपत्रेण वासि(मि)नेन सि(मि)नेन वा ।

यस्तत्कर्माणि निष्पातः सुपङ्क्तं पाटयद्विपक्ष ॥

Pālākāpya, III. iv.

वृद्धिपत्रेण नागानां कुप्याच्छेदनं भेदने ।

Pālākāpya, III. i.

³ अथ निषण्णनाथाद्योक्तेन विधिना सुवर्जितं चारुचर्ममिविवासाऽऽग्नि(मि)न्य सन्धानुगतं मतिमत्तं सत्यमुखं नाडीत्रयमेषया च विदित्वा वृद्धिपत्रेण यस्मिन्नागुलीमं पूयप्रति, रक्षाच्छेदं कुप्यात् ॥

Pālākāpya, III. xv.

⁴ प्रचयि वा 'चुरिणाङ्ग' केवलानिलपीडितम् ।

तत्र प्रदेहं दद्याच्च पिटं गुह्याकलेः कृतम् ॥

तेनाववाहता पीडा विपक्षी रचसी तथा ।

अन्यापि दातृजापीडा प्रशंसं याति वेगवः ॥

Śārṅgadharma Saṅgraha, III. xi.

directs us to scarify a part with a razor and then apply an ointment of guñjā (*Abrus precatorius*) in sciatica, scrofulous glands of the neck, etc. For treating a person in the state of unconsciousness caused by the derangement of all the humours, he directs us to scarify the anterior fontanelle with a razor, then to apply as much medicine as can be carried on the point of a needle to the part and rub it with fingers¹. The medicine is to be prepared thus :—take aconite 1 pala, quicksilver 1 śāna; mix, and put inside two sorābas or earthen basins smeared with powdered glass and placed face to face. Apply some external application over this and put it on fire for six hours. Then open the basins, take the soot collected on the upper basin and deposit it in a glass vessel quickly to prevent exposure. Caraka² also advises us to apply a medicinal paste on a cranial incision, shaped like

- ¹ निधं प्लवितं मृतः शालिकयन्त्रेऽङ्गुष्ठम् ।
 तच्चूर्णं सम्पुटे च लला काचलितमराधयोः ॥
 मुद्रां दत्त्वा च संशोष्य ततश्चाङ्गं निवेशयेत् ।
 बहिर्धं शनैः शनैः कुर्यात् प्रहरद्वयं संश्लेषा ॥
 तत उन्मत्ता तन्मुद्रामुपरिस्थे सारावके ।
 संश्लेषो यो भवेद्भुजः तं मञ्जीषाच्छनैः शनैः ॥
 वायुस्वर्गो यथा नम्यात् ततः कुप्यो निवेशयेत् ।
 रसः सुवीमुखेलप्रक्षुब्धो निश्रान्ति भेषजम् ॥
² तापश्चाचो रसो देवो मुर्च्छिते सन्निपातिनि ।
 पुरेण प्रक्षिते मुर्च्छिते तदङ्गुल्या च चर्षयेत् ॥
 रक्त भेषजं सम्पर्कांमुर्च्छितोऽपि हि जीवति ।
 तत्रैव संपदंष्टम् सतावस्योऽपि जीवति ।
 यदातापो भवेत् तदा शशुरं तत्र दीयते ॥

Śārṅgadharma Saṁgraha, II, xii.

- ³ विषदूषितं कफमारं शीतमरोधरुहवायुश्च ।
 सततं च मेघाद्यैः स्यादसाध्यल्लिङ्गेऽपि जीवति ॥

the foot of a crow, in case of snake-bite when he becomes unconscious but his life is not completely despaired of.

4. NAKHA ŚĀSTRA OR NAIL PARER.

Suśruta¹ mentions its length to be eight aṅguli. Dallaṇa² says that its blade is two aṅguli long and one aṅguli broad. Vāgbhaṭa³, on the other hand, describes the length to be nine aṅguli. Arunadatta⁴ thinks it to be a double instrument, one end having a straight edge and the other an oblique one. Some explain⁵ that two different kinds of nakha śāstra—one with a straight and the other with an oblique edge—are directed to be used.

चर्मोक्षपायाः कल्म विलसन् मूर्ध्नि काकपदमभा ।

छत्वा कुर्यात् कटुर्भी कटुकोटफला प्रथमनच ॥

Caraka Saṁhitā, VI. xxv.

¹ तत्र नखग्रन्थैष्यन्नावष्टाङ्गुलि मूयोवत्यने ।

Suśruta Saṁhitā, I. viii.

² नखग्रन्थमिति नखानां हिदनाय शस्त्रं नखग्रन्थं तस्या फलं वाङ्मुलाद्यामम् एकाङ्गुलं विस्तृतम् ।

Nivandha Saṁgraha, I. viii.

³ वक्रजुंघारं विस्तृतं नखग्रन्थं नवाङ्गुलं ।

सूत्रग्रन्थोद्भूतिश्चैदं प्रच्छान् लेखने ॥

Aṣṭāṅga Hrdaya Saṁhitā, I. xxvi.

⁴ नखग्रन्थं नखग्रन्थेदकं प्रसिद्धं । तच्च वक्रा वक्रजुंघारा यस्य तदेवम् । तस्यैकं मुखं वक्रमन्वहंजु स्पष्टम् ।

Sarvāṅgasundarī, I. xxvi.

⁵ नखग्रन्थमाह वक्रजुंघारमित्यादि नखानां हिदनाय शस्त्रं नखग्रन्थं तत् विस्तृतं वि द्विः प्रकारं मुखं यस्या तद्विस्तृतं तथा वक्रजुंघारं एकं वक्रं धारं अपरम् वक्रजुंघारं स्यात्, तस्या नवाङ्गुलं लभ्यतेऽपि देव्येण नवाङ्गुलपरिमितं तच्च नखग्रन्थं शल्योद्भूत्यादी शल्यं शल्यानां कष्टकदीनामुद्भूतिं हृत्वायं शल्योद्भूतिः प्रच्छानं चिरा इति यस्या प्रसिद्धिः लेखनं चोचन् इति लोके ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

They are principally recommended for cutting, puncturing and scarifying¹; and also for the extraction of needles and minute foreign bodies from the soft parts.

There is no mention of a many-bladed scarificator in the surgical books of the Hindus, but its office was performed by the *nakha śāstra*, in wet cupping, by making parallel incisions close to one another.

Paul² alludes to an instrument compounded of three blades joined in such a way that at one stroke, three scarifications were made; but he prefers a single scalpel for the purpose.

Pālakāpya mentions an instrument called *rampaka*³, having the handle ten *aṅguli* and the blade three *aṅguli* long. It is to be used for paring the nails and cleaning the feet of the elephants.

5. MUDRIKĀ.

It is described to be a cutting instrument of the size of the last phalanx of the index finger⁴; it is also called *aṅguli-śāstra* or finger-knife. *Vāgbhaṭa* describes this instrument but not clearly. He says that the mouth of the *aṅguli-śāstra* looks as if coming out of a ring, and the blade is half an *aṅguli* wide. A ring, having the size sufficient to admit the terminal phalanx of the index

¹ इहिपत नखमल मुद्रिकोपलपकाई धारानि वेदने भेदने ।

Saṁskṛta Saṁhitā, I. viii.

² Paulus Aegineta, VI. xlii.

³ रम्पकलाङ्गुलमुखी दशाङ्गुलवत पादमोधनाय नखच्छेदनाय चेति ।

Pālakāpya, III. xxx.

⁴ प्रदेशित्वरपर्णप्रदेशप्रमाणामुद्रिका ।

Saṁskṛta Saṁhitā, I. viii.

finger, should be soldered to it. The base of the instrument has a thread tied to it¹.

It is recommended to be used for cutting through neoplasms in the throat. In its uses, Vāgbhaṭa says that it resembles the maṇḍalāgra and vṛddhipatra; and so was sometimes required for perforating the skull of a dead foetus in the uterus of its mother².

Dr. Simpson of St. Andrews (1744) is said to have invented an instrument, a "ring scalpel" for opening the skull. It consists of a loop of steel, through which the finger is to be passed

¹ कुर्यादङ्गुलिशस्त्रकं ।

मुद्रिकानिर्गतमुखं फलेऽङ्गुलायतं ।

योगतो इहपिपेण मण्डलायेण वा समं ।

तत्प्रदेशिन्वय पर्वप्रमाणापेन मुद्रिकम् ।

सूत्रवहं मूलस्रोतो रोगहेदन भेदने ॥

* Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुर्यादङ्गुलिना अङ्गुलिशस्त्रकं व्यति । मुद्रिका अङ्गुरीयकेण निर्गतं निष्क्रान्तं मुखं यस्य तत्तथाविधं मुद्रिकानिर्गतमुखं तथा फले फलोद्देशे अङ्गुलायतं अङ्गुलमात्र विस्तार अङ्गुलि शस्त्रकं अङ्गुलिनाम शस्त्रं कुर्यात् । तच्च योगतः प्रयोगे इहपिपेण मण्डलायेण वा समतुल्यं भवति । लेखने अहेदने इहपिपेवत् योज्यं किम्वा हेदन भेदन पाटने मण्डलायवत् योज्यमित्यर्थः । तदित्यादि तदङ्गुलि शस्त्रकं प्रदेशिन्वय पर्वप्रमाणापेन मुद्रिकं कुर्यादिति योज्यं । येषाम् प्रदेशिनी नाम्नी अङ्गुलि संस्था अथ यत्पर्वं तत्तथा तस्य यत् प्रमाणं परिमाणं तदपेक्षा तत् प्रवेशोपयुक्ता मुद्रिका यस्या तत्तथाविधं । मुद्रिका मुदरी आकटी इति वा ज्ञाता । तथा सूत्रवहं मूलदेशे सूत्रेणवहं तच्च मूलस्रोतो गतानां रोगाणां हेदने भेदने च योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

² शिक्खी नाम ती मूदी शस्त्रदारवमहेतः ।

मण्डलाङ्गुलि शस्त्राभ्यां तत्तकर्म प्रयसते ।

इहपिपे हि तीक्ष्णार्थे न योनाववचारयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, II. ii.

and from which protrudes a sharp pointed blade about an inch long, by which the cranium was pierced¹.

In the pseudo-Hippocratic treatise² a knife to fix on the thumb and dismember a foetus in utero is mentioned. This knife is called by Turtullian³ the "ring knife", whereby the limbs are advised to be cut off in the womb. It is interesting to point out that *mudrikā* also means a ring.

The veterinary surgeons still use a scalpel blade mounted on a ring⁴, through which a forefinger is passed to dismember foals and calves in exactly the same way.

6. UTPALAPATRA.

This knife is described to have the shape of a petal of the blue lotus. The end is long, sharp and pointed. The *utpalapatra* is *dīrgha-vaktra* or long bladed, while the *arddhadhāra* is the *hrasva-vaktra* or short bladed knife⁵. It is to be used for cutting through and puncturing the parts.

¹ Ed. Med. Essays, vol. V, Part I, P. 445.

² Hippocrates, I. 463.

³ De Anima, 26.

⁴ Græco-Roman Surgical Instruments, Pl. vii. fig. 1.

दीर्घं वक्रवक्त्रं यदायथ ।

उत्पलाभ्यधाराख्ये मेदने छेदने तथा ॥

Asṭāṅga Hṛdaya Saṁhitā, I. xxvi.

उत्पलपत्राख्यधाराख्ये शस्त्रे चाह उत्पलाद्यादि उत्पलस्य अध्यधारास्य ते आख्ये ययोः शस्त्रयोः सौ उत्पलाभ्यधाराख्ये शस्त्रे तथा, यदाक्रमं दीर्घं वक्र वक्त्रं भवतः । तत्र उत्पलाख्यं दीर्घवक्त्रं, अध्यधाराख्यं वक्रवक्त्रमित्यर्थः । उत्पलस्येन उत्पलपत्राख्यं शस्त्रं गम्यते तन्मान्तरदर्शनात् । तस्य फलस्य उत्पलपत्रकारत्वाद् उत्पलपत्रमिति संशयतम् । अधिक्रमं धारा यस्या ततः अध्यधारा । इतः फलयोर्मध्ये फलस्यैव किञ्चिदधिकं दीर्घमिति वर्तते । तत्र अष्टाङ्गुलावतं उरसि अङ्गुलं विस्तारं ।

Yāgbhātārtha Kaumudī, I. xxvi.

In the Aśvavaidyaka, the utpalapatra and vrihipatra knives are recommended to be used in puncturing the veins in phlebotomy¹. "The surgeon who is practically acquainted with the methods of puncturing the veins, should use the utpalapatra and vrihipatra knives for the purpose."

When used for puncturing the large veins the knife is recommended to be encircled with thread at a short distance from the end to prevent unnecessary injury to the vessels by plunging the the knife deeply².

Hippocrates similarly "guards his phlebotome in the surgical treatment of empyema, by having it wound round with a rag, leaving the breadth of the thumb nail at the point."³

Both the utpalapatra and vrihimukha knives are thus described in the Aśvavaidyaka⁴: The "vrihimukha knife should be six aṅguli long and half an aṅguli wide. The utpalapatra should also be similarly made."

The utpalapatra knife is recommended to be used for incising

¹ शस्त्रे शीतपलपत्रे च व्रीहिपत्रे वा भिषक् ।

शिरावेधविधिं मन्यन् दृष्टकर्मा प्रयोजयेत् ॥

Aśvavaidyaka, XIV. v. 23.

² सूत्रकेन च संवेष्ट्य सुखं शस्त्रस्य बुद्धिमान् ।

यथाप्रमाणं संस्थाप्य ततो विस्त्रावयेत् शिराम् ॥

Ibid, XV. v. 35.

³ Hippocrates, II. 258 Kuhn's Ed. and I. 88 Syd. Soc. Ed.

⁴ अर्द्धाङ्गुलम् विस्तीर्णं कूर्चच्छस्त्रं षडङ्गुलम् ।

नाम्ना व्रीहिमुखं मन्यक् तथा शीतपलपत्रकम् ॥

Aśvavaidyaka, XIV. v. 21.

the abdominal parietis of the horse; then a tube is to be pushed through the wound in the operation of *paracentesis abdominis*¹.

The phlebotome used by the Greeks is nowhere described in their books; but from considerations of all the various operations to which the instrument was put bears out the fact of its being a sharp pointed, double-edged and straight lancet. The phlebotome of the Greeks might have then resembled in shape the *utpalapatra* of the Hindus. It was used by the Greeks for various operations besides phlebotomy, as for the opening of abscesses such as the *parulis* or gum boil², puncture of cavities containing fluid as in opening the abdomen for ascites³, incising the *tunica vaginalis* as in excision of hydrocele sac⁴ and for dissecting out warts⁵ and sebaceous cysts⁶.

It is interesting to note that *Pālakāpya*⁷ mentions *utpalapatra* and describes it to be eight *āṅguli* long, one and a half *āṅguli* broad and double edged. He uses it for puncturing vessels etc.

¹ हृदयसाधरे भग्नि ऊर्ध्वभागे च नाभितः ।

अधोभा नाभितः कूर्चच्छेदनं चतुरङ्गुलि ॥

शस्त्रेणोत्पलपत्रेण वामभागे दिवचक्षः ।

एकमेवाङ्गुलिं शस्त्रं कुक्षौचापि प्रवेशयेत् ॥

वेधत्रणे ततस्तस्मिन् नालिकां वस्त्रवेष्टिताम् ।

प्रचिप्य गालवेदरि यावद्देहोऽहलाचवम् ॥

Aśvavaidyaka, I.II. vs. 25, 26 and 27.

² *Paul*, VI. xxvii.

³ *Ibid*, VI. L.

⁴ *Ibid*, VI. lxii.

⁵ *Ibid*, VI. lxxxviii.

⁶ *Ibid*, VI. xiv.

⁷ बौद्धिमुखप्रमाणमुपलपय भेदनाय ।

7. ARDDHADHĀRA.

It is difficult to ascertain the exact shape of this knife. Some translate it as a "single edged knife,"¹ but it really means, as Dallāṇa explains, an instrument which has a sharp edge for half the length². It is also called cakradhāra. Vāgbhaṭa has a variant reading—adhyārdhadhāra—which means an instrument having a sharp edge for more than half the length³.

It is eight aṅguli long; the blade is two aṅguli long and one aṅguli wide, and the handle six aṅguli long. It is to be used for incision and division of parts of the body.

8. SŪCĪ OR NEEDLES.

Three needles are recommended to be used for applying sutures. They should be strongly made and rounded in shape. At one end they are flattened, grooved and pierced with an eye for the suture. The groove is said to have been intended to be the bed of the suture during stitching to prevent it from doing any harm to the tissue. In fleshy parts such as the thighs, a three ribbed needle, three aṅguli long, is advised to be used. For less fleshy parts and wounds about the joints, a similar straight needle but two aṅguli long should be employed, while for suturing the wounds of the stomach, intestines, scrotum and the vital parts of the body, preference is given to a needle curved like a bow, two and a half aṅguli long and having the pointed end

¹ Hærnle's Translations of Sūtrata Samhitā, Bibl. Ind. I. viii.

² 'अर्धधारमिति, 'अर्ध धारा यस्या तत् 'अर्धधार', चक्रधारमिति प्रसिद्धं तच्च 'अष्टाङ्गुलायतं' चरसि 'अष्टाङ्गुलं विस्तारं' द्वाङ्गुलं फलं । 'अने त्वध्यर्धधारमिति पठन्ति, 'अधिकमर्धं' धारायस्या तत् 'अध्यर्धधारम्' ।

Nivandha Saṅgraha, I. viii.

³ See foot-note 5, P. 240.

shaped like a paddy. In thickness, these needles are described to be equal to the stalk of the flower of *mālati* (*Jasminum grandiflorum*). They should have sharp fine points and good shape¹. The needles are also recommended to be used for extraction of foreign bodies from the soft structures and also for evacuating abscesses².

देशेऽस्यमांसे सन्वी च सूची इत्याहुलहयं ।
आयता बाहुला च्चा मांसस्य वापि पुजिता ॥
धनुर्वका हिता मर्मफलकोषोदरोपरि ।
इत्येतान्निविधाः सूचीसीष्णायाः सुसमाहिताः ।
कारयेन्मालतीपुष्पवन्तासपरिमण्डलाः ॥

Suśruta Saṁhitā, I. xxv.

इत्याहुद हृदाः पात्रे विभः सूचीऽथ सौवने ॥
मांसलानां प्रदेशानां वाचा बाहुलमायता ।
अल्पमांसस्य संस्त्रिष्व ब्रणानां बाहुलायता ।
ग्रीहिवका धनुर्वका पक्कामाशयमग्नेसु ।
सा साहबाहुल सन्वी इत्यासाधतुरहुला ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

विस्मृता सूचीनां विषयविशिष्टे आकारभेदानाह मांसलानामित्यादि 'मांसलानां' ऊर्ध्वादीनां शरीर प्रदेशानां सौवनार्थे सूची, 'वाचा' चिकीर्णविशिष्टा तथा बाहुलमायता, अहुलपक्षदीर्घा कर्तव्या, अस्यास्तासुल मयमामसौव न तु सन्वीवयवसा । सूचाः सर्वेऽवयवसा हि साधारणतो हत्वा कारतनिर्देशादितिमर्थः । अस्या अपि गृह हृद पाशलं सामान्योक्त्या कथितसौव अल्पमांसलस्थान संस्त्रितानां, सन्धास्य संघितानां च ब्रणानां सौवने बाहुलायता, अहुलिवय दीर्घा, सूचीकर्तव्या, पक्कामये, आमाशये तथा 'मर्मसु' वन्तादिषु संस्त्रितानां ब्रणानां सौवने, ग्रीहि वका, पाटलादि ग्रीहिवमुक्ता, 'धनुर्वका' धनुर्वहकाकारा या सूची साहबाहुला, अहोबाहुलाधिक बाहुल दीर्घा योज्येति वीज्य' अपापि गृह हृद पाशलं योजनीयं । साहबाहुलैक्येनोक्तः शब्दः । सर्वेत्यादि परिण सम्बध्यते ॥

Vāgbhaṭārtha Kaumudī, I. xxvi.

¹ सूचीकुक्षपवाटीमुखगरारीमुखान्मुखविकृषकानि विभावये ।

In modern times, the surgeons use fully curved, half-curved and straight surgical needles. Waring¹ remarks: "The shape of the needle which ought to be used for closing an incision depends upon the depth and accessibility of the wound. In deep wounds, or wounds which are not readily accessible, curved needles will be found to be most useful, while for shallow cuts straight needles will be most convenient."

Suśruta makes mention of a javamukhī needle² (*lit.* having the sharp end shaped like a barley corn) for passing a double ligature smeared with escharotic ointment, across the base of a tumour in opposite directions. Then by cutting through the nooses, and tying together the contiguous ends of the ligatures, the whole of the growth is encircled and strangled by them, exactly in the same way as in modern times a naevus is ligatured by means of a naevus needle. Cakradatta also quotes this description of the method of extirpating tumours by ligatures.

Erichsen says³: "When the tumour is small, an ordinary double ligature may be passed across its base, by means of a common suture needle; and the noose being cut and the thread tied on each side, strangulation will be effected. When it is of larger size, and of round shape, the most convenient method is that recommended by Liston. It consists in passing, by means

¹ Manual of Operative Surgery. By H. J. Waring, M.S., M.B., Third edition, P. 42.

² शर्बुदादिषु चोत्थिष्य मूले हव' निधापयेत् ।

मूचीभिर्ववक्त्राभिराहितं वा समलतः ।

मूले मूलेन वध्नीयाच्छिष्टं चोपचरेदन्नयम् ॥

Suśruta Saṁhitā, IV. xvii.

Cakradatta, Nāḍīrasapacikitsū.

³ Erichsen's Surgery, Vol. II, P. 73.

of long navus needles, fixed in wooden handles, and having their eyes near their points, double whipcord ligatures in opposite directions beneath the tumour; then cutting through the nooses, and tying together the contiguous ends of the ligatures until the whole of the growth is encircled and strangled by them."

There are many instances of the use of surgical needle by the Greek and Roman Surgeons. Needles of different sizes are recommended. Celsus mentions a large needle in describing the operation of suturing the abdominal parietis¹, and another, evidently a small needle, which is said to have been used in the treatment of staphyloma of the cornea². The needles were either round or three-cornered. "A few three-cornered needles of Roman origin have been found, although they are rare" (Milne³). Paul uses a needle in suture of the upper eyelid, and other modes of operating for trichiasis⁴, for the repair of wounds of the peritoneum⁵, and recommends a large sized needle containing a double thread to close the peritoneum in the operation for enterocele⁶.

Pālakāpya mentions *sūci* or needles for stitching wounds⁷. They are eight *āṅguli* long, shaped like the tusk of an elephant and are either three ribbed, or four ribbed, or round, smooth and

¹ Celsus, VIII. xvi.

² Ibid, VII. vii.

³ Græco-Roman Surgical Instruments, P. 75.

⁴ Paulus Ægineta, VI. viii.

⁵ Ibid, VI. iii.

⁶ Ibid, VI. lxx.

⁷ सूची सेवनाय । अष्टाङ्गुलं नागदन्ताकृति । त्र्यष्टा चतुरष्टा वा दृष्टा समाहिता यथा मलाका वने वक्रविधृष्यम् ।

strong. He reserves curved three-cornered needles for fleshy parts and round needles for skin, veins, nerves and arteries¹.

Caraka recommends the use of leeches, knife and needles for extracting blood from the piles². He also advises us to use needles for pricking the patches of leprous spots³ before the application of leeches for extracting blood.

9. KUŚĀPATRA.

It is a form of knife resembling in shape the leaf of a kuśa grass (*Poa cynosuroides*)⁴. The instrument should be six aṅguli long (Suśruta); the blade measuring two aṅguli (Vāgbhaṭa)⁵

- १ याः सूक्ष्मविधाः प्रोक्ताः शस्त्राध्याये संस्थिताः ।
नागदन्ताकृतिर्हन्ता विकोषा चेति निश्चयात् ॥
अस्थ्यादितं नागदन्तया मांसजं च विकोषया ।
लकक्षाया धमनीस्थं च शिराजं चैव हतया ।
आहार्ये सर्ववन्तायाः सूत्रा सोढवमिच्छते ॥

Pālakāpya, III. i.

- २ जलीकीमिः तथा शस्त्रेः सूक्ष्मिर्वा पुनः पुनः ।
अथर्मानं रुधिरं रक्ताग्रोष्ठिः प्रवाहयेत् ॥

Caraka Saṁhita, VI. ix.

- ३ प्रच्छिन्नमज्जं कुष्ठं विरेचयेद्वा जलीकामिः ।

Ibid, VI. vii.

- ४ कुशपत्रमिति, कुशपत्रतुल्यं कुशपत्रं तन्नामनाहः—

अङ्गुलैरुचकं विशादङ्गुलं फलमुच्यते ।
इत्थं स्यात् त्र्यङ्गुलं मध्ये कुशपत्रस्य लक्षणम् ॥

Nivandha Saṁgraha, I. viii.

- ५ कुशाटो वदने चाश्वे बाहुलं स्यात्तयोः फलं ॥

Aṣṭāṅga Hṛdaya Saṁhita, I. xxvi.

कुशाटो वदने वे शस्त्रे, सान्ये विस्त्रावण विषये योज्ये । तयोः कुशाटो वदनयोः फलं बाहुलं, अङ्गुलद्वयं परिमितं स्यात् ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

and the handle four aṅguli, but according to Bhoja, the handle is three aṅguli long. It is to be used for draining pus from abscess. The handle has a ring like ornamentation, about one aṅguli in diameter. Another variant reading describes the blade, the ring, and the handle to have the lengths of two, three, and two aṅguli respectively. This would make the total length of the instrument to be seven aṅguli; so evidently there is some lapsus calami in the second reading.

Cakradatta uses kuśapatra as a bleeding lancet and says¹: "Out of the twelve vessels that lie on the sides and underneath the tongue, select the two large bluish vessels on either sides of the tongue, raise them up by vaṭṭiśa or hook and puncture them by the kuśapatra knife and then, after bleeding, apply a paste of treacle and ginger to the wound". In the Yogaratnākara², the author advises us to adopt this method of bleeding, in the treatment of tumours in the neck.

Pālakāpya mentions kuśapatra and describes it as being shaped like a kuśa grass³. It is nine aṅguli long—the handle being

- ¹ जिह्वायाः पार्श्वतोऽधस्तां शिरा द्वादश कौर्त्तिताः ।
तासां स्थूलशिरं ब्रूये विध्यात् ते तु शनैः शनैः ॥
वङ्गिशेषेव संगृह्य कुशपत्रेण वृद्धिमान् ॥

Cakradatta, Galagaṇḍa Cikitsā.

- ² जिह्वाधः पार्श्वयोर्मूलाब्धिरा द्वादश कौर्त्तिताः ।
तासां स्थूले शिरं रे च च्छिन्द्यान् च शनैः शनैः ।
वङ्गिशेषेव संगृह्य कुशपत्रेण वृद्धिमान् ।
सुति रक्ते ब्रूये तद्धिन् दद्यात्तप्त मुहुर्भाद्रकम् ॥

Yogaratanākara, P. 321.

- ³ नवाङ्गुलं कुशपत्रं । पञ्चाङ्गुलं वृत्तं । चतुरङ्गुलम् पत्रं । अध्वार्धाङ्गुलविक्षुप्त-
सुमयतो धारं । कुशपत्राकृतिं गन्धोरपाकभेदनायं षडङ्गुलं वृत्तम् अध्वार्धाङ्गुलं पत्रं ।

Pālakāpya, III. xxx.

five or six aṅguli and the blade four aṅguli long. The blade is one and a half aṅguli wide and is sharp-edged on both sides (*i.e.*, double-edged). It is used for incising deep abscesses.

10. ĀTĪMUKHA.

This instrument is described to have the shape like the beak of the jalavardhani bird or āṭī¹ (*Turdus ginginiamus*),—a bird living in the marshes. It is six aṅguli long; the blade measuring two and the handle four aṅguli. So it is of the same size as the kuśapatra to which it also resembles in function. Bhoja is of opinion that its blade is one and the handle seven aṅguli long.

11. ŚARĀRĪMUKHA.

This instrument is a pair of scissors resembling the face of the long beaked bird called śarārī. Dallāṇa describes two varieties of the bird, one with white shoulders, and the other with a red head. It is the former kind which is referred to here². Suśruta describes its length to be ten aṅguli³, while Dallāṇa mentions the length to be twelve aṅguli.

¹ 'आटीमुखमिति, आटी जलवर्धनी नाम पक्षिविशेषः तन्मुखवन्मुखं यस्या तत् आटीमुखं तदाचोक्तः'—

इत्थं सताङ्गुलं विद्यात् तस्याग्रे फलनिष्ठत्वे ।

आटीमुख प्रकारं हि फलमङ्गुलमायतम् ।

Nivandha Saṁgraha, I. viii.

² 'शरारीमुखमिति, दीर्घेवसुः पक्षिविशेषः स द्विविधः धवलकल्मसः रक्तशीर्षश्च धवलकल्मसश्च शरारीति संज्ञा तन्मुखवन्मुखं तस्य शस्त्रस्य लोके कर्तरीति संज्ञा ताच्च द्वादशाङ्गुलां चक्षुष्मासां कुर्यात् ।

Ibid.

³ 'दशाङ्गुला शरारीमुखी सा कर्तरीति कथ्यते ।

Suśruta Saṁhitā, I. viii.

It is recommended to be used for evacuating abscess¹, etc. Suśruta mentions karttari as a synonym but Vāgbhaṭa counts it as a separate instrument. He describes karttari as a pair of scissors used by the barbers for clipping hair and is said to have been necessary for dividing the nerves, ligaments and fine hairs².

12. ANTARMUKHA.

Suśruta describes another variety of scissors, used principally for evacuating abscesses. It is so named, for its straight cutting edges are within its curved claws³. It is said to be six aṅguli long and one and a half aṅguli broad⁴. It seems that the curvature of the blade varied widely; and Vāgbhaṭa describes a variety called

¹ साय्ये शराय्यासाविकुञ्चिके ।

Aṣṭāṅga Hrdaya Saṁhitā, I. xxvi.

‘साय्ये विस्वाक्नविषये कश्चेति शराय्यासाविकुञ्चिके हे शस्त्रे योज्यः । तत्र शराय्यासाविकुञ्चिके शरीरमुखं शरीरी दीर्घचतुः पक्षिविशेषः तस्या मुखवदासं यस्या तत् शराय्यासाविकुञ्चिके, तत्र चतुर्मुखं दशाङ्गुलं दीर्घं कार्यम् ।’

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² सायु गृह्य कचच्छेदे कर्तरी कर्तरीनिभा ।

Aṣṭāṅga Hrdaya Saṁhitā, I. xxvi.

कर्तरीशस्त्रमाह सायुत्यादि कर्तरीनामशस्त्रं कर्तरीसदृशं तत्र सायुच्छेदने सूक्ष्मकेश-
च्छेदने च योज्यम् । कर्तरी काटारी इति यस्य प्रसिद्धिः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ अन्तर्मुखमिति मध्यमुखं तद्वचनमाह—

चटाङ्गुलप्रमाणेन जिह्वचारेण चावृतम् ।

शस्त्रमन्तर्मुखं नाम चन्द्रार्द्धं इव चोदितम् ।

Nivandha Saṁgraha, I. viii.

⁴ तद्वदन्तर्मुखं तस्य फलमध्यार्द्धमङ्गुलं ॥

Aṣṭāṅga Hrdaya Saṁhitā, I. xxvi.

arldhacandrānan¹ or “half-moon faced” scissors in which the blades are curved like the half-moon. It has the length of eight aṅguli, the blade measuring one and a half aṅguli. This is also to be used for letting out pus from abscesses.

Hārīta, however, mentions a śāstra, called also arddhacandra or half-moon, but he recommends its use for excising the prolapsed arms of a dead foetus to effect its delivery². This instrument can not but be a knife, for it seems difficult to cut off the arm, even of a foetus, with a pair of scissors. Moreover, antarmukha has never been credited with the power of excising the arm.

13. TRIKŪRCCAKA.

It has been translated in English as a thin-edged sharp instrument or trocar. Wise, Dutt and Hoernle agree to mean by it a trocar. But it can be better explained if we understand by the term an instrument consisting of three needles fixed on a round

अपरश्च. विस्वावण शस्त्रमाह तद्विधादि तद्वत् कुशाटीवदनवत्, अलर्मुखं अलर्मुखं नाम शस्त्रं स्वाये योज्यं तस्य अलर्मुखस्य फले अर्धचन्द्राकारं स्यात् । अपि अधिकं अर्धं अर्धं । सर्द्धकमङ्गुलमित्यर्थः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

¹ अर्धचन्द्राननं चेत् तद्याध्यङ्गाङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अलर्मुखस्य प्रकारमेदमाह अर्धचन्द्राननमित्यादि एतत् अलर्मुखं, अर्धचन्द्राननं अर्धचन्द्राकारमुखश्च भवति, तदपि तद्वत्, कुशाटीवदनवत् स्वाये योज्यं । तच्च फले अर्धचन्द्राकारं स्यात्परिमाणं कलमित्यर्थः । अर्धचन्द्राकारमुखत्वात् अस्य शस्त्रस्यापि अर्धचन्द्राननमिति संज्ञेति बोध्यं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² अथवा अर्धचन्द्रेण शस्त्रेनैव सततमंशं बाहुयुगलं सञ्चिद्य बाह्वनिःसारयेत् ।

Hārīta Saṁhitā, III, II.

wooden handle¹. According to Suśruta, the length of the instrument is six aṅguli. But others describe it as eight aṅguli long, the blade and the handle measuring three and five aṅguli respectively². The distance between the edges is the breadth of a grain of rice. The end of the handle is ornamented with a circular metallic plate as a ring.

It is recommended to be used for evacuating abscesses and for draining blood from the nasal polypus.

Caraka³ mentions an instrument called kūrcea and says :—
“After fomenting and thus softening the rounded nodules (of leprosy) which are fixed and hard, by heated stones and fumigations through tubes, they are to be injured by the kūrcea and the blood that oozes out, should be wiped away.”

Two other instruments are described by Vāgbhaṭa as being constructed on a similar principle. One is named kūrcea and the

¹ चिकृर्षकमिति त्रयः कृर्षा यस्य तत् चिकृर्षकम् । कृर्षः कृषी इति श्लोके ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² चिकृर्षकमिति त्रयः कृर्षा यस्य तत् चिकृर्षकम् तच्च तन्नामरम् :—

अङ्गुलानि त्रयाष्टौ च शूलं कार्यं चिकृर्षकं ।

फलैरनमृखाकारैर्वङ्गुलैरन्वितं त्रिभिः ।

एकैकस्य फलस्यैषामन्तरं त्रौहिमश्चितम् ।

इत्तं पञ्चाङ्गुलायामे कार्यं रुचकमुपेतम् ॥

Nivandha Saṁgraha, I. viii.

³ स्थिरकठिनमण्डलानां स्थिन्नानां प्रसारप्रवाहीभिः ।

कूर्चेर्विघट्टितानां रक्तात्कृष्टे शीघ्रपनेतव्यः ॥

Caraka Saṁhitā, VI. vii.

other, *khaja*. The *kūreca*¹, he describes as an instrument "consisting of seven or eight rounded sharp needles, four *aṅguli* long, nicely bound together by a cord and tightly fixed on a circular wooden handle." He mentions its use in the operation of scratching to cure baldness and the brown and black spots on the face. For scarifying a bald spot, *Cakradatta*² uses needles, rough leaves, etc. "The *khaja*³," *Vāgbhaṭa* continues, "consists of eight rounded needles having the sharp ends half an *aṅguli* long. It is to be introduced

¹ कूर्चोद्विर्त्तक पीडय्याः सम्राट्टौ वा सुवन्धनाः ।

संयोज्य नीलिका व्यङ्ग केन मातेषु कुहने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

सम्प्रति कूर्चाख्यं शस्त्रं लघ्वयित्माह सञ्ज्ञेत्यादि ताः सूचः सल्लेख इत्याः वर्तुलाः तथा चतुरङ्गुलाः चतुरङ्गुलदीर्घाः कूर्चः इत्युच्यन्ते । ताः सूचः पुनः कौडशाः ? इत्येकपीडय्याः इत्ते वर्तुलि एकखिन् दृष्टे संस्थिताः, एकं इत्याकारं काष्ठफलकं परिवेष्ट्य स्थिता इत्यर्थः । तथा सप्तसंख्यका षट्संख्यका वा, तथा शीभनं रज्ज्वादिकृतं बन्धनं यासां तालाद्याविधाः सुवन्धनाः । स कूर्चः नीलिकादिषु रोगेषु कुहने कुहनार्थे संयोज्यः प्रयोज्य इत्यर्थः । कुहनं चाञ्जान इति लोके । नीलिकादयो बल्यमाणा केशशतः केशानां पतनं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² श्वगादपदस्यैव पुच्छयित्वा पुनः पुनः ।

Cakradatta, Kṣudraroḡa Cikitsā.

श्वगादपदमिति गन्धरूपदं यथास्यात् तथा सूचीनखरज्ज्वादिभिः पुच्छयित्वा * * *

Tattva Candrikā, ibid.

³ अर्द्धाङ्गुलमुखे उन्नेरटाभिः कष्टकैः खजः ।

पाणिभ्यां मध्यमाग्नेन प्राणाग्नेन हरेदसक् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

खजसंश्लेषश्चमाह अर्द्धाङ्गुलमुखेरित्यादि अर्द्धाङ्गुलप्रमाणं मुखं येषां ते अर्द्धाङ्गुलमुखा शेषार्द्धाङ्गुलमुखेः इतैः वर्तुलैः अटाभिः षट्संख्यकैः कष्टकैः कृतं शस्त्रं खज उच्यते । तेन खजाख्येन शस्त्रेन पाणिभ्यां इत्याभ्यां मध्यमाग्नेन चालोद्यमाग्नेन प्राणात् नासिकायाः अक्षक्रेतं हरेत्, निर्हरेदित्यर्थः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

into the nostrils and turned to and fro with both hands to bleed the nasal polypi."

The Greeks and Romans used a similar instrument for identical purpose. It was called *katiádion*, measuring a blade of grass, and was used for opening abscesses of the womb and tonsils, drawing blood from the inside of the nose and perforating the fetal cranium.

In India, the practice of drawing blood from the nasal polypus by blades of grass is still in vogue; and Aræteus mentions it as a common mode of scarification in ancient Greece also¹. "On the next day we are to abstract blood from the inside of the nostrils, and for this purpose push into them the long instrument named *Katiádion*, or the one named *Toryne*, or in want of these we must take the thick quill of a goose, and having scraped the nervous part of it into teeth like a saw, we are to push it down the nostrils as far as the ethmoid cells, then shake it with both hands, so that the part may be scarified by its teeth. Thus we shall have a ready and copious flow of blood; for slender veins terminate there and the parts are soft and easily cut. The common people have many modes of scarification, by rougher herbs and dried leaves of the bay, which they introduce with the fingers and move strongly." Paul² opens the vessels in the nostrils with the reed called *typha*.

14. KUTHĀRIKĀ.

It is a small instrument shaped like an axe, so called from its resemblance to *kuthāra*, an axe which is still used in India

¹ Extant works of Aræteus, P. 460.

² Paul, vol. II. Sec. lx.

for cutting wood¹. Vāgbhaṭa says² that "the base of the blade is thicker and broader than the end and is fitted to a handle, seven and a half aṅguli long. The blade which is shaped like the tooth of a cow, has the width of one aṅguli." Bhoja describes the width of the blade to be a half aṅguli³. It is recommended to be used for puncturing vessels in the following manner⁴:—"Hold the handle with the left hand and put the blade on the vessel resting on a bone. Raise the instrument a little upwards and then strike over the thick base of the blade with the downward strokes of the middle or index finger, when let go

¹ For figure of Kuṭhāra as used in Ancient India, see Pl. xxii in Ferguson's Tree and Serpent Worship.

² पृथुः कुठारी मोदकसदृशाङ्गुलानना ।

तयोर्दण्डया विधेदुपयेस्थौ शिरां स्थितौ ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुठारिका संश्रक्तं शस्त्रमाह पृथुरित्यादि कुठारी पृथुः स्यात् । कुठारिका नामशस्त्रं पृथुः खलुत्वं सादिशब्दः । तथा मोदकसदृशाङ्गुलानना गवां दन्तः मोदक ससदृशं तुल्याकारं अङ्गुलायतं चाननं मुखं यस्याः सा तथा विषया तथा कुठार्या जर्दण्डया अस्थौ उपरिस्थितौ शिरां विधेत् । तद्वत् वामहस्तेनोन्नीकृत्य कुठार्यामुखं शिरोपरि संस्थाप्य दक्षिणाङ्गुलतर्जनीभ्यां कुठारिकामलकमभिष्टुत्य शिरां विधेत् ।

Vāgbhaṭārīha Kaumūdī, I. xxvi.

³ कुठारिकेति कुठारतुल्या कुठारिकाः—

कुठारिकाया इलं स्यात् सार्द्धसप्तङ्गुलायतं ।

फलमर्द्धाङ्गुलायानं मोदकसदृशं समम् ॥

Nivandha Saṁgraha, I. viii.

⁴ तथा मध्यमयाङ्गुल्या वैद्योऽङ्गुलं विमुक्तया ।

ताडयेदुत्थितां शालां स्पर्शादवाङ्गुलं पीडनैः ॥

कुठार्यां लक्षयेन्मध्यं वामहस्तं मङ्गीतया ।

फलोद्देशे मुनिष्कर्म्यं शिरां तद्वत् नीचयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

forcibly from the under surface of the thumb". Cakradatta¹ also advises us to use it in a similar manner. To open the veins in fleshy parts, Vāgbhaṭa recommends the vrīhimukha knife, while the kuṭhārikā is advised to be used in venesection on bony structures.²

Pālakūpya³ mentions the kuṭhāra and describes its shape to be like an axe. It is to be used for excision and scarification. He describes another śāstra called vatsadanta (*lit.*, the calf's tooth); it is ten aṅguli long; and the mouth of the instrument is one and a half aṅguli broad. It is also to be used for excision.

"Bleeding from the jugular vein, he (Albucasis) describes much in the same way that it is now practised by veterinary surgeons, namely, by placing a sort of scalpel bent at the point, which he calls fissorium, upon the vein, and striking the instrument with a hammer or some such body. He gives drawings of variously shaped lancets for opening the veins of the arm."⁴

"Ferriers bleed with a fleam, which, though apparently a clumsy method of operating, is certainly safer than the lancet in

¹ वामहस्तेन विनमस्य कुठारीमिदं तु ।

तादृशेन्द्रध्यानाङ्गुल्याङ्गुलविटम्बमुक्त्वा ॥

Cakradatta Śirāvyādhādādhikāra.

² मांसले निचिपेद्दे जे व्रीह्यां व्रीहिमात्रकम् ।

यवाईमस्युमुपरि शिरां विध्वन् कुठारिकाम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ कुठाराकृतिं कुर्यात् । कुठारी शस्त्रपच्छेदनाय । वत्सदन्ताकृतिं वत्सदन्तं दशाङ्गुलम् ।
एकेकमध्यङ्गुलमुखम् । एवमेतानि च व्रीह्यापि यथावीर्यं प्रच्छेदयेत् ।

कुठाराकृतिशस्त्रेण ततस्तं प्रच्छेदयेद्विषक् ।

नातिगाढं न च लघुं न घनं विरले न च ॥

Pālakūpya, III. iii.

⁴ Albucasis Chirrug. ii. 97; also see Adam's Commentary on Paul, VI. ix. 323.

unknown hands." "In bleeding with a fleam, the near side is most convenient. In skilful hands, there is no occasion for a blood stick, as the fleam may be struck with the right hand if it is made broad and round at the back. It also may be made much smaller and neater than that generally employed". There is a drawing of such an improved fleam which much resembles in appearance the kuṭhārī of the Hindus. "A fleam is rather more convenient instrument in bleeding, either from the arm or thigh, as the vein is somewhat apt to roll when a lancet is used."¹

15. VRĪHIMUKHA.

It is described as a kind of trocar², the sharp end being pointed and shaped like a grain of paddy. It is six aṅguli long, the handle being two and the blade four aṅguli (Bhoja). But Vāgbhata³ describes the length of the blade to be one and a half aṅguli.

It is advised to be used for paracentesis abdominis in abdominal dropsy. Suśruta says :⁴ "The friends of the patient should

¹ White's Compendium of the Veterinary Art, 1851, 18th ed. P. 342.

² व्रीहिमुखमिति व्रीहिमुखमिव मुखमस्य व्रीहिमुखं तत्र भोजः—

शस्त्रं व्रीहिमुखं कार्यमङ्गुलानि यदायतम् ।

वाङ्गुलं तस्य द्वयं स्यात् तत्फलं चतुरङ्गुलम् ।

तन्मुखं व्रीहिविकारं तनुर्हृद्गुदकण्ठकम् ॥

Nivandha Saṁgraha, I. viii.

* * * * * तयाध्यवाङ्गुलं फली ।

व्रीहिवक्त्रं * * *

Aṅgāṅga Hṛdaya Saṁhitā, I. xxvi.

* उदकोदरिणस्तु वातहरतैलाभ्याक्तसोऽथोदकस्त्रिद्वयं स्थितस्यातः सुपरिगृहीतस्याकचात्-
परिवेष्टितस्याधो नाभिर्ध्वांस्तथचतुरङ्गुलमपह्वाय रोमराज्या व्रीहिमुखेनाङ्गुलीदरं प्रमाणमवशादं
विध्यते ॥

Suśrutā Saṁhitā, IV. xiv.

hold him under the axilla. Then the abdomen is to be tapped by the *vṛhimukha* knife at a point, four *āṅguli* distant on the left side from the median line, underneath the navel." *Vāgbhaṭa*¹ advises us to surround a broad bandage round the abdomen before tapping it by the instrument, which he recommends to be introduced up to one *āṅguli*. *Cakradatta*² refers to works on surgery for the surgical treatment of ascites. A small incision is directed to be made before the puncture.

In the *Aśvavaidyaka*, for this operation, the *utpalapatra* knife is recommended; an incision four *āṅguli* long is directed to be made above or below the navel of the horse, and then the end of the knife is to be plunged into the abdominal cavity up to one *āṅguli*.³ The *vṛhimukha* is also advised to be similarly used.⁴

Hippocrates speaks of evacuating the fluid in *paracentesis abdominis* with an instrument which Camper thinks must have been a kind of trocar.⁵

सज्जले जठरे तैलेरभ्यक्तस्यानिष्ठापयति ।
 क्षिप्रस्रोताम्बुना कक्षमुदरे परिवेष्टिते ॥
 वह्निद्रोदितोस्थाने विध्यैदङ्गुलमात्रकम् ।
 निधाय तस्मिन्नाङ्गीच स्यादवेर्हमन्धसः ॥
 अथास्य नाङ्गीमाह्वय तैलेन लघवेन च ।
 ब्रह्मभक्ष्यं वहा च वेष्टयेद्वाससीदरम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, IV. xv.

* जातं जातं जले स्नायुं शस्त्रीकं शस्त्रकर्म च ।

Cakradatta, Udaracikitsā.

¹ See foot-note, 1. p. 242.

² See foot-note, 4. p. 241.

³ See the Commentary on Paul. By Adams, vol. II, P. 238.

It is also to be used for puncturing the vessels in phlebotomy (Vāgbhāṭa)¹ especially in the fleshy parts of the body.² Cakradatta uses vṛhimukha in phlebotomy and says: "The sharp end of the vṛhimukha should be kept under the palm between the thumb and index finger and is to be thrust into the seat of puncture."³

Suśruta directs us to use it in tapping the hydrocele:⁴ "Then the hydrocele is to be wrapped round with a bandage. The fluid is next to be drained by tapping it with a vṛhimukha on the lower part of the scrotum, little externally to the suture." Similar directions are given in the Yogratnākara.⁵ Cakradatta also gives a similar description.⁶

¹ व्रीहिमुखाय प्रयोज्यं तत्सिरोदरयोर्वध्यैः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

व्रीहिमुखाय ग्रन्थं चाह व्रीहिमुखादि व्रीहिमुखाय वक्तुं यस्या तत् व्रीहिमुखा ।
व्रीहिमुखं यत्ग्रन्थं तत्सिरानां व्यधे व्यधने तथा उदरस्य जलोदरस्य व्यधे सावधानं
योज्यं ।

Vāgbhāṭārtha Kaumudī, IV. xxvi.

ताडयन् पीडयेच्चैर्ना विध्येद् व्रीहिमुखेन तु ।

Aṣṭāṅga, Hṛdaya Saṁhitā, I. xxvii.

² मांसलि निःक्षिपेद् द्वे व्रीहिमुखं व्रीहिमाचकम् ।

Ibid.

मांसलेखकाशेषु यवमात्रं ग्रन्थं निदध्यादतो हन्येज्ज्वल्यवमात्रं व्रीहिमात्रं वा
व्रीहिमुखेन ।

Suśrutā Saṁhitā, IV. viii.

³ ततो व्रीहिमुखं व्यध्यप्रदेशे न्यस्य पीडयेत् ।

अङ्गुष्ठतर्जनीभ्याम्बु तलप्रच्छादितं भिषक् ॥

Cakradatta Śīrāvyañhādīkara.

⁴ See foot note 5, P. 123.

⁵ संस्वेद्य मृतप्रभवं वस्त्रखण्डेन वेष्टयेत् ।

सौवम्या पादंतोऽधस्ताद्विध्येत् व्रीहिमुखेन वै ॥

Yogarātnākara.

⁶ संस्वेद्य मृतप्रभवतां वस्त्रपट्टेन वेष्टयेत् ।

सौवम्याः पादंतोऽधस्ताद्विध्येत् व्रीहिमुखेन वै ॥

Chakradatta Vṛddhi Cikīṭā.

Paul describes the operation but he recommends a sharp-pointed knife or lancet instead of a trocar. He says: "Wherefore we must make the patient stand erect; or if this can not be done, we must cause him to be seated; * * *. We give orders to the assistants standing behind to press with their hands and push downwards the swelling to the pubes. Then taking a sharp-pointed knife or lancet, if dropsy be among the intestines, in the perpendicular line of the navel, and about three fingers' breadth distance from it we divide the hypogastrium as far as the peritoneum."¹ Celsus mentions that some perform it at a spot four fingers' breadth below the navel in the left side, and recommends us to use a perforator, the point of which should be about the size of the third part of a fingers' breadth.² Vegetius, the veterinary surgeon, recommends paracentesis for the dropsy of cattle.³ The Arabic authors Avicenna,⁴ Serapion,⁵ Albucasis,⁶ Haly Abbas,⁷ and Rhases,⁸ give similar descriptions.

In modern times, we perform the operation in the same way. "It is necessary in certain conditions to tap the abdomen in order to withdraw fluid which has accumulated there and this is usually done by means of a special trocar and cannula. The site for tapping is selected, the usual spot being in the middle line, half-way between the umbilicus and the pubes. A

¹ Paulus Ægineta, Bk. VI. l. Syd. Soc. Ed.

² Celsus. vii. 15; ii. 10.

³ Vegetius. Mulom. iii. 25.

⁴ Avicenna, iii. 14; iv. 13.

⁵ Serapion. iv. 7.

⁶ Albucasis: Chirrag. ii. 54.

⁷ Haly Abbas, Pract. ix. 41.

⁸ Rhases, Cont. xix.

small puncture about one-third of an inch long is made with the knife at the spot selected. The trocar and canula to which the rubber tubing is attached, are then thrust through the abdominal wall into the peritoneal cavity."¹

The Greeks did not describe the operation of tapping the hydrocele. They always preferred the open incision to puncture. Paul uses a knife for making the skin incision, but when the tunica vaginalis is laid bare, he divides it through the middle with a lancet for bleeding.² Some of the Arab authors mention the operation of puncturing the scrotum for hydrocele. If the patient be timid, and do not choose to submit to open incisions, Albucasis advises the surgeon to let out the water either with a scalpel or the instrument used for tapping in dropsy. He states, however, that the water will collect again after this operation.³ Rhases also describes this operation.⁴

In modern times, trapping for hydrocele is still practised. "When trapping a hydrocele the patient should be sitting up in a chair * * *. The scrotum, having been cleansed, is grasped from behind by the left hand * * *. A spot, free from any large veins, is selected on the anterior and lower part of the swelling, and the trocar and canula introduced with sharp stabbing movement."⁵

Pālakāpya⁶ describes vrihimukha as shaped like a grain of paddy and recommends it for scission and excision of muñja.

¹ Operations of General Practice, By Corner and Pinches, P. 109, 2nd ed.

² Paulus Aegineta, VI. lxii.

³ Albucasis, Chrug. ii. 62.

⁴ Rhases, Cont. xxiv.

⁵ Operations of General Practice, P. 145.

⁶ खवणं पाटनं चैव कुण्डोद्दीहिमुद्धेयं तु ।

16. ĀRĪ OR AWL.

It is a long sharp needle in handle, so called from its resemblance to the shoe-maker's instrument known as awl. "It has a total length of sixteen aṅguli, with a sharp end of the size of a sesamum seed. The handle is tapering like a cow's tail and is equal in circumference to the young stem of Dūrvā (Unodon Dactylon)" (Bhoja)¹. Suśruta mentions its length to be six aṅguli. Vāgbhaṭa describes the length to be one aṅguli, the basal half being round, and the terminal half, four cornered and sharp pointed. The terminal part is introduced into the inflammatory swellings to confirm the diagnosis of suppuration. It is also to be used to drain the congested blood vessels in the matrix of the nails as a result of traumatism².

¹ अरिति, अरिव आरा असिः कर्मकाराणां शस्त्रं । तव तन्मानरम् :—

आरा द्वाष्टाङ्गुल्यमाना कर्णव्या तु विनाम्पते ।

तिलप्रमाणानु फलं तस्याः कार्यं समाहितं ।

दुर्वाङ्गुरपरीक्षादं इनां सौपुच्छसन्निभं ।

Nivandha Saṁgraha, I. viii.

² व्यधने कर्णपालीनां युधिका मुकुलानना ।

आराष्टाङ्गुलं इत्तास्या तत्प्रवेशो तथोद्भूतः ॥

चतुरस्या तथा त्रिष्पेक्षोद्यं पञ्चमं संशये ।

कर्णपालीच वङ्गलां वङ्गलाया न च शस्यते ॥

मुवा विभागशयिरा वाङ्गुला कर्णवेधनी ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

सम्प्रति कर्णपालि व्यधने योग्यानि शस्त्राणि वज्रमाह व्यधने इत्यादि कर्णपालीनां कर्णलतानां व्यधने व्यधनविषये युधिका युधिका नाम शस्त्रं वीज्यं । कौहशी ? मुकुलानना मुकुलवत् प्रकृतत्वात् युधिका मुकुलवत् आननं मुखं यस्याः सा तथाविधा । अरित्यादि अष्टाङ्गुलं परिमाणं इत्तं वर्णं लं आस्त्रं मुखं यस्याः सा तथा अष्टाङ्गुलवृत्तास्या, तथा स एव अष्टाङ्गुलप्रमाणः प्रवेशः प्रवेशनं यस्याः सा तथाविधा तत् प्रवेशा तथा कर्तव्यः इत्ताष्टाङ्गुलादुपरिष्ठात् तथा अष्टाङ्गुल परिमाणैव चतुरस्या चतुष्कोणा सा आरा कथ्यते ।

It is also said to have been used for perforating a thick lobule of the ear, though for this purpose another instrument called *kārṇa-vedhanī* or ear-perforator—a needle specially meant for perforating the lobules of the ears,—is mentioned. It is three *aṅguli* long, having a slit or eye in the three-fourths of its length. The barbers used a similar needle to perforate the ears on the ceremony of tonsure.

For piercing the lobule of the ear, another instrument is mentioned. It is called *jūthikā*, from its end resembling in shape the conical bud of *jūthikā* flower (*Jasminum Auriculatum*).

Suśruta uses *ārā* or *pāṇimantha* to perforate the bone in diseases of the medullary canal caused by the obstructed and deranged air¹. He next introduces one end of a tube open at

एतेन आरायाः कलं एकाङ्गुलपरिमितमिति फलति तत्र प्रथमाङ्गाङ्गुलं द्वयं पराङ्गाङ्गुलं चतुरस्रं तयोश्चतुर्भागेऽन्तर्ध्वं अष्टाङ्गुलतुरस्रो भागः प्रवेशयोग्य इति सूचितं । तदा आराया पञ्चमं संशये अयं शोथः पक्व आसौवेति संशये सति तादृशं शोथं विधातुं, तथा वहलां अतिमांसलां कर्णपालीचं तथा विधादिति योज्यं । वहलमित्यन्तेन च्छेदः । वहलाया-मित्यादि वहलायाः अतिमांसलायाः कर्णपाल्याः व्यधने कर्णवेधनी नास्ती सूची च शस्यते । कीदृशी ? विभागशुधिरा, विभागः शुधिरं यन्त्रं यस्याः सा तथाविधा विभागशुधिरा तथा वाङ्गुला चङ्गुलवयदीर्घा । न केवलमारा वहलायाः कर्णपाल्या व्यधने शस्यते अपि तु कर्णवेधनी नास्ती सूची च शस्यते इत्यर्थः । कर्णवेधनीं सूचीं अष्टादशीया नरमुन्दरा कर्णवेधनायै व्यवहरन्ति । अतोऽपि वाङ्गुलवर्णयेति ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

¹ निरुद्धेऽस्थनि वा वायी पाणिमन्त्रेण दारिते ।

नाङ्गीं दत्त्वास्नि भिषक् चुषयेत् पवनवली ॥

Suśruta Samhitā. IV. iv.

निरुद्धे इत्यादि । त्वर्कमांसं शस्त्रेण विपाद्य अस्त्रि पाणिमन्त्रेण आशस्त्रेण विद्धा तत्र रग्ने हिमुर्ध्वीं नाङ्गीं प्रणिधाय मुखमावृतं चुषयेत् त्वनापकर्षणं करणीयमिति ।

Nivandha Saṁgraha. IV. iv.

both ends into the canal through the hole in the bone, while through the other end the surgeon sucks out the air by his mouth.

For perforating the ears of the elephants, a similar needle is recommended by Pālakāpya. It is known as *karmāra* or *nālī*.

17. VETASAPATRAKA.

It is a long sharp cutting instrument shaped like the leaf of the rattan (*Calamus Rotang*). Its edge is finely serrated and very sharp. The blade and handle are equal in length, measuring four *aṅguli*. Bhoja says: "The blade is one *aṅguli* wide"¹. It is said to have been used for puncturing vessels in phlebotomy².

18. VADĪŚA OR SHARP HOOK.

In shape it is described to resemble the ordinary fish-hook. Bhoja describes the total length to be six *aṅguli*, its hook being half an *aṅguli* and its handle five and a half *aṅguli* long. The end is bent; the curvature varies and may be shaped like a half-moon³.

¹ वेतसपत्रमिति, वेतसपत्रमिव वेतसपत्रमत्र भोजः—

तौल्यमङ्गुलं विस्तारं चतुरङ्गुलायतं ।

पङ्क्त्यानि तु चत्वारि ह्यन्ये कार्ये विज्ञानता ॥

Nivandha Saṁgraha, I. viii.

² वेतसं व्यधने ।

Aṣṭāṅga Hṛdaya Saṁhita, I. xxvi.

वेतसपत्रादि शस्त्रनाह वेतसमित्यादि वेतसं वेतसपत्रं नामशस्त्रं सिरादीनां व्यधन कर्त्तव्यं-
योग्यं । वेतसपङ्क्त्यङ्गुलानामस्य वेतसं वेतसपत्रं वेति संज्ञा ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ वक्रिमिति वक्रिमनुष्यं वक्रिमं मनुष्यावेधनीमाहः । तत्र तन्वात्तरं :—

वक्रिमी चापि कर्त्तव्ये प्रमाणे तु पङ्क्त्यं ।

स्नानतनुं तथोरिकमेकं नाव्यायनं भवेत् ।

Suśruta says¹ : The end of the hook is sharply edged and is said to have resembled the new leaf of Java (*Hordeum vulgare*).

It is recommended by Suśruta² to be used for extraction of foreign bodies, *e.g.*, the extraction of stone from the urethra. Its use is also mentioned for transfixing the membranous expansion in the operation for pterygium³ and for fixing and dragging the uvula and tonsil before the performance of any operation on these parts⁴. Cakradatta⁵ mentions its use for fixing a growth, before its excision by the knife.

‘अर्द्धापञ्चाङ्गुलं’ इत्यं श्रेष्ठं कार्यं मुखं तयोः ।

‘अर्धचन्द्राकृतिं’ वक्त्रं कार्यं नाभ्यान्तसा तु ।

स्नानतं नामयेत् ततः वङ्गिश्चभिधस्वरः ।

इत्याययोरन्तरं स्याद् यावदर्द्धाङ्गुलं मतं ।

Nivandha Saṅgraha, I. viii.

¹ वङ्गिमोदनाशङ्कुशान्तराये तीक्ष्णकण्टकं प्रथमयवपत्रमुखे ।

Suśruta Saṁhitā, I. viii.

² यद्वक्ष्या वा मुचनार्गप्रतिपद्मान्तरासक्तो यकाग्ररो शर्करा वा स्रोतसा अपहरेत् एवं चामकं विदार्य वा नाड्यौ शस्त्रेण वङ्गिमोदरेत् ।

Suśrutā Saṁhitā, IV. vii.

³ यद्वक्ष्येयुष्णिकार्मादेर्वङ्गिश्चः सुनताननः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

वङ्गिश्चस्त्रमाह यद्वक्ष्ये इत्यादि मुक्तं नतं अङ्गुशवत् नमज्जतं आननं मुखं यस्य स तथाविधः सुनताननः वङ्गिश्चं मत्स्ववैधनवत् वङ्गिमोदनाम शस्त्रं स्यात् । स च युष्णिकार्मादेर्यद्वक्ष्ये योज्यं । आदिपदेषु उपजिह्विकादि परिरुहः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ पिङ्कामुत्तमाण्याश्च वङ्गिमोदुरेद्विषक् ।

उङ्गुलं मधुसंयुक्तैः कषायैरवचूर्णयेत् ॥

Suśruta Saṁhitā, IV. xxi.

⁵ उत्तमाण्यान्पिङ्कान् संक्षिप्य वङ्गिमोदुताम् ।

Cakradatta, Śukradoṣa Cikitsā.

It was also used for fixing any growth in the eye, previous to its excision by the *maṇḍalāgra*¹. For this purpose the Greeks used the *vulsellum* (*myzon*). Aetius says: "If there is a large and malignant excrescence in the angle of the orbit, the enlarged part must be seized with *vulsella* and cut off."²

Evidently *vaḍiśa* was used on many occasions when in modern times we use the dissection forceps to steady a part before excision.

Vaḍiśa is described in the *Aśvavaidyaka*³ to have been similarly used during the operation of *pterygium* in horses.

*Pālākāpya*⁴ mentions *vaḍiśa* which is described as eight *aṅguli* long, the end being rounded like a wheel. It is to be used for raising the membranes of the eye globe.

Sharp hooks were used by the Greeks and Romans, for similar purposes. The use of the sharp hook for fixing the *pterygium* is mentioned by Celsus⁵, Aetius⁶, Paul⁷ and Albucasis⁸.

Its use in the excision of the tonsil is mentioned by Paul⁹. After the patient being placed in the proper position, he narrates: "We take a hook (*tenaculum*) and perforate the

¹ See foot notes 1, 2 and 3, p. 227.

² Aetius, vi. 74.

³ चितौ निपात्य तुरगं ततोमेव प्रसारयेत् ।

ऊतकयोः निषस्त्रिद्वान् वडिशेनाशिकम् नि ॥

Aśvavaidyaka, XXX. v. 32.

⁴ वडिशं चक्रायमष्टाङ्गुलप्रमाणमक्षौः पटलोदरनाथं चेति ।

Pālākāpya, III. xxx.

⁵ Celsus, VII. vii.

⁶ Aetius, Tet. ii, iii, 63.

⁷ Paul, VI. xviii.

⁸ Albucasis, *Chirurg.* ii, 16.

⁹ Paul, VI. xxx.

tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to the hand, called ancylostomus, for there are two such instruments, having opposite characters".

19. DANTA ŚĀṆKU OR TOOTH-SCALER.

Its head is half an aṅguli long. It is quadrangular in shape and has a sharp edge. Suśruta¹ describes the end as slightly bent, sharp and shaped like the fresh leaf of Java. Bhoja² describes the end to be like that of the vṛihimukha.

Vāgbhaṭa³ describes a similar instrument called dantalekhana or tooth-scaler. It is also quadrangular in shape, one side being sharp-edged and the opposite side little lengthened. It is

¹ See foot note I. P. 265.

² एवं हि क्रियते एतौ दशमकुम्भिजानता ।
 शङ्खुश्च मुखं तस्य कार्यमङ्गुल्यायतम् ॥
 चतुरस्रं समक्षेव तीक्ष्णधारं समाहितं ।
 इत्याद्यं तस्य कर्तव्यं शस्त्रं वौहिसुखाकृतिः ।
 कपालिकां शर्करांश्च दन्तस्थानेन शोधयेत् ॥

Nirandha Saṁgraha, I. viii.

³ एकधारं चतुष्कोणं प्रवृद्धाकृतिं चैकतः ।
 दन्तलेखनकं तेन शोधयेद्दन्तशर्करान् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

दन्तलेखनं शस्त्रमाह एक धारमिथादि एका चारा यस्या तत् एकधारं चतारः कोणा यस्या तत् चतुष्कोणं कोणः कोणा इति यस्या प्रसिद्धिः तथा एकतः एकदिग्भात् प्रवृद्धा वट्टनशीला आकृतिः आकारो यस्या तत्तद्याविधं प्रवृद्धाकृति दन्तलेखनं दन्तलेखनाख्यं शस्त्रं स्यात् तेन दन्तलेखनाख्यानं शस्त्रेण दन्तशर्करान् दन्तनिवहान् शर्करास्थान् लेखयेत् कर्शयेदिदमर्थः । दन्तलिप्याने श्वनेनेति दन्तलेखनं दन्तशर्करा पाथरि इति लोके ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

recommended to be used for the extraction of sordes and tartar from the teeth ¹.

The procedure of the operation of tooth-extraction is not described in detail in the medical books of the Hindus. But the operation seems to have been well known, for Suśruta distinctly advises the students to practise the operation of extraction on the fruits of Panas (*Atrocarpus Integrifolia*), Vimbī (*Cephalandra Indica*), Vilva (*Egle Marmelos*) and on the teeth of the dead animals ². He also advises us to extract the wisdom teeth and to apply cauterity to their sockets ³. Also when a tooth becomes loose he directs us to extract it and apply cauterity to the socket ⁴. In the treatment of sinus caused by carious tooth, he advises us to extract the tooth, otherwise the sinus would extend down to the inferior maxillary bone ⁵.

¹ शस्त्रेण दन्तवैदर्भं दन्तमूलानि शोधयेत् ।

• • • • •

अहिंसन् दन्तमूलानि शकैरामुद्धरेद् भिषक् ।

Suśruta Saṁhitā, IV. xxii.

² See foot note 2. P. 280.

³ लघुन्नाधिकदन्तान् ततोऽधिसवचारयेत् ।

हृदिदन्तक-बद्धापि विधिः कार्यो विज्ञानता ॥

Suśruta Saṁhitā, IV. xxii.

⁴ चलमुत्तुल्य च स्थानं विदहेच्छुधिरसा च ।

Ibid.

⁵ यन्दन्तमधिजायेत नाडी तंदन्तमुद्धरेत् ।

कित्वा मांसानि शस्त्रेण यदि नोपरिजोभवैत् ॥

शोधयित्वा दह्मपि चरिष्य ज्वलनेन वा ।

भिनख्युपेक्षिते दन्ते हनुकास्थि गतिप्रुध ॥

समूलं दमनं तस्मादुद्धरेद् भग्नमस्थि च ॥

उद्धृतेतुलरं दन्ते सयले स्थिरवन्तान् ॥

Ibid.

Pālakāpya¹ mentions the extraction of tooth of the elephant by means of enīpada which is an iron bar, thirty-two aṅguli long and equal to the tooth in circumference.

Paul says²: "The laminae which unite to them (the teeth) we may remove as may appear proper, with the concave part of a specillum, a raspatory, or a file." The operation of tooth-extraction was however, not liked by the ancient Greeks as cases in which the operation proved fatal, occurred in their practice. Cælius Aurelianus, Herophilus, and Galen disapprove in general of the operation, except in extreme cases.

It would, no doubt, be interesting to know that in ancient India, the Hindus knew how to make false teeth to be used by men who have lost them either by accident or by extraction by the dentists. In 1194 A.D., Sahabuddin defeated Jayacandra in battle, "and the incident of the body of the rāja being recognised by his false teeth"³—a circumstance which throws some light on the state of manners" is well known.

20. EṢAṆĪ OR SHARP PROBES.

"The probes", says Caraka⁴, "are of two kinds, the hard or

- ¹ हातिमदंशुलायतदशनपविनाहिन लीहदण्डेन ।
एनीपदेन कुष्मादृक्तरथं तयोः सम्भक् ॥
ब्रीहिमुलेन च परिशोध सर्व्वतसा दन्तमुलेषु ।
उच्योदकधीतेषु मधुसर्पिः पूरणं दद्यात् ॥

Pālakāpya, III. xviii.

² Paul. VI. xxviii.

³ Elphinstone's History of India, P. 363, 3th Ed.

⁴ द्विविधमिषणां विद्याम्बद्धौ च कठिनामपि ।
उद्भिदैश्च दुग्भिनां लोहानां वा मलाकया ॥
गन्धौरमांसस्य देशे पार्श्वे लीहणलाकया ।
एवं विद्याद् ग्रथं नालेविपरीतमतो भिषक् ॥

Caraka Saṁhitā, VI. xiii.

metallic probes, and the soft probes such as the young stems of plants. The hard probes are required for deep sinuses in the fleshy parts and the sides of the body, while the softer varieties are used for probing the superficial sinuses². The ends of the probes are generally shaped like the head of the earth-worms³. Suśruta² describes them to be eight *āṅguli* long. They are to be used as probes to ascertain the direction of sinuses.³ The blunt probes have been described before under the *śālākās*.⁴

The sharp probes have the shape of a needle and are six *āṅguli* long. The other end carries an eye through which is put one end of a caustic thread (*i.e.*, thread soaked in caustic lotion and then dried). The probe is to be used for piercing the tissues through the blind end of the sinus. The end of the thread is next to be withdrawn from the eye of the probe and a tight knot applied with the other end. The intervening bridge of tissues is thus gradually cut and the sinus opened. If the cord be found inefficient for the purpose, a second thread is to be tied similarly.⁵

² एषधी गण्डुपदाकारमुखी ।

Suśruta Saṁhitā, I, viii.

³ तत्र नम्रमृन्मौषसावटानि ।

Ibid.

⁴ गतेरन्वेषणे दृक्का गण्डुपदमुखेपधी ।

Aṣṭāṅga Hṛdaya Saṁhitā, I, xxvi.

एषादृक्का इत्यत्र गतेरित्यादि एषधीनाम इत्यं गतेः नाडीवक्रता पृष्ठादिपदसा चन्वेषणे चन्वेषणे योज्यं । सा चैषधी दृक्का कोमलमृन्मौषा, तथा गण्डुपदमुखा, महीलता मुखकार मुखा च भवति ।

Vāgbhaṭārtha Kaumūdī, I, xxvi.

⁵ See page 155-7.

⁶ कृमदन्वेषणीरणां नाडीमर्शदिताश्च यः ।

चारमूलेष तां विन्द्यान् तु शस्त्रेण बुद्धिमान् ॥

This method of treatment is recommended for the weak and timid patients. The needle-shaped probe is also to be used in the extirpation of new growths by means of caustic threads. Cakradatta¹ also describes this operation; evidently he copies it from Suśruta. In the Yogaratnākara² the verses describing the operation are also quoted. Vāgbhaṭa also mentions a needle-shaped probe for the same purpose.³

In treating of fistula-in-ano, Paul quotes from Hippocrates and says⁴ :—"For Hippocrates directs us to pass a raw thread,

एषश्चा मतिमन्विष्य चारुत्वानुसारिणीम् ।
 सूचीं निदध्याद्वत्सले तद्योद्धव्याय निहरेत् ॥
 सूचमालां समानीय शोदयन् समाचरेत् ।
 ततः चारु वल्ग्वं बीज्य सूचमन्वत् प्रवेशयेत् ॥
 चाराक्तं मतिमान् वैद्यो यावन्नच्छिद्यते गतिः ।
 भगन्दरेऽप्येष विधिः कार्यः वैद्येन जानता ॥
 अर्जुदादिभु चोत्थिष्य मूले सूचं निधापयेत् ।
 सूचोभिर्दाषवक्त्राभिराचितं वाऽसमन्ततः ।
 मूले मूलेष वध्नीयाच्छिन्ने चोपचरेद्भणः ॥

Suśruta Saṁhitā, IV. xvii.

¹ These verses are quoted in the Cakradatta, Nāḍivraṇa Cikitsā.

² Also quoted in the Yogaratnākara, P. 349.

³ मेदनाद्येऽपरा सूचोमुखा मूलनिविष्टा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अपरमयेषथो शस्त्रमाह । मेदनाद्ये इत्यादि मेदनाद्ये नाडीव्रणानां गतिमेदनये अपरा पूर्वोक्ताया एषश्चा अस्या सूचोमुखा सूत्राकार मुखा स्यात् तथा मूलं मूलदेशे निविष्टं, सूचनिवेश योग्यं खं छिद्रं यस्याः सा मूलनिविष्टा सच्छिद्रमूलमित्यर्थः । अस्या एषश्चासूले छिद्रकरणं चारुत्वानुवन्धनाय । तेन अभिन्न दारुनिष्काशितेन हृदयस्थेन चारुमूलेष नाडीव्रणः प्रकाशयते ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ Paul. VI lxxviii.

consisting of five pieces, through the fistula by means of a probe having a perforation, or a double headed specillum; and to tie the ends of the thread and tighten it every day until the whole intermediate substance between the orifices be divided and the ligature fall out". Hippocrates ¹ describes minutely the apolinose and recommends it for those who from timidity avoid a surgical operation. Celsus recommends the thread to be smeared with some escharotic ointment. The process, he says, is slow but free from pain². Albucasis ³ also approves of the operation according to circumstances. The operation called apolinose *i.e.*, by the ligature, is very celebrated. Ambrose Pare, Foubert, Camper, Giudo de Cauliaco and Rogerius approve of the ligature. It has been recommended by some of the modern surgeons⁴. The operation is still practised in India by the Madras specialists for fistula-in-ano.

Vāgbhaṭa ⁵ describes copper probes having the sharp ends shaped like the buds of Kuravaka (*Baleria Cristata*) to be used in

¹ Hippocrates. 'De Fistulis'.

² Celsus. vii. 4.

³ Albucasis. Chirrug. ii. 80.

⁴ Lancet. vol. 1. 1845, new series.

⁵ ताम्बी शलाका हिमुखा मुखे कुरवकाकृतिः ।

लिङ्ग नामं तथा विध्येत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

शलाका शस्त्रं बहुलि शस्त्रबाह ताम्बीत्यादि हिमुखा, द्विवारा, मुखे, मुखप्रदेशे कुरवका कृतिः, रक्तभिच्छीपुष्य मुकुलकारा, ताम्बी, ताम्रमयी, शलाका, शलाका शस्त्रं स्यात् । तथा शलाकया लिङ्गनामं, कफोत्थं पटल संज्ञकं चक्षुरेण विशेषं विध्येत् । विध्येदित्यनेन शब्देः ।

the operation of cataract. Suśruta¹ describes such a probe to be eight aṅguli long, made of copper, or iron, or gold, the ends being shaped like buds. A thread is spirally twisted round the middle of the instrument for a length of a thumb's breadth, to afford a firm grasp by the surgeon's fingers. This instrument must not be rough, thick or very sharp, for then there would be a greater chance of the eye being injured more than is necessary and at many places. So also in couching of cataract, Celsus says: "Then a needle is to be applied, sharp so as to penetrate, but not too fine."²

Pālakāpya³ mentions eṣaṇī in the surgical treatment of diseases of the elephants. He describes three probes,—smooth and shaped like the collyrium rods. They are recommended to be ten, twenty and thirty aṅguli long respectively.

- ¹ शलाका कर्कशायुलं खरा दीपपरिप्लुति ।
 त्रयं विशालं स्तुलाभा तीक्ष्णा हिंसादनेकधा ॥
 जलाश्रावणं विषमा क्रियासङ्गमवास्थिरा ।
 करोति वर्जिता दीपैस्तथादिभिर्हिता भवेत् ॥
 चटाहुलायता मध्ये स्तूपेण परिवेष्टिता ।
 अद्भुतं पर्वसमिता वक्रबोर्धुकला कृतिः ॥
 ताम्रायसी शतकौश्री शलाका सप्तादनिन्दिता ।

Suśruta Saṁhitā, VI. xvii.

² Celsus. VII. viii.

- ³ स्मिरा खरी च कर्कश्या त्रयानामिषयी भवेत् ।
 इत्था मण्डपदमुखी प्रमाणे विंशदाहुली ॥
 सुवर्षं प्यतामाशानायसी मङ्गलापि वा ।
 दन्तास्थिवैतुदाक्षामिषयी दारुणा भवेत् ॥

Pālakāpya, III. i.

एषयी दशाहुला विंशदाहुला विंशदाहुला यथायोगमन्त्रशलाकाकृति मुखतः दन्ता समा
 चैवमेतास्तिष एषयाः प्रमाणतः कार्याः ।

Ibid, III. xxi.

The operation of couching for cataract is essentially an Indian operation; and Suśruta describes the operation minutely as follows :—

The operation of couching for cataract.

Suśruta says¹ : “Now we shall describe the treatment of cataract caused by phlegm. If inside the crystalline lens, anything is seen like a half-moon-shaped drop of water or pearl, hard, irregular

- * औष्णिके लिङ्गनामे तु कर्म्यं वक्ष्यामि सिद्धये ।
 नचेदहेन्दुघनान्मुक्त्वा मुक्ताकृतिः स्थिरः ॥
 विषमो वा तनुर्मध्ये राजिमान्वा बहुप्रभः ।
 दृष्टिस्थो लघ्वति दीपः स्रक्वा वा सुलोहितः ॥
 शिग्धस्त्रिदंसा तस्मात् काले नात्युत्तरीतले ।
 रलितस्योपविष्टसा स्त्रान्नासां पद्मतः समं ॥
 सतिमान् यत्कृभागी द्वौ कृष्णाम्बुकाश्चपाङ्गतः ।
 उन्मोक्त्य नयने सम्यक् शिराजालं विवर्जिते ॥
 नाधो नोर्ध्वं पार्श्वान् किं च देवकृते ततः ।
 शलाकया प्रयत्नेन विषमं यववक्रया ॥
 मध्यं प्रदेगित्वङ्गुष्ठस्थिरहस्तं गृहीतया ।
 दक्षिणेन भिषक् सत्यं विध्येत् सत्येन चैतरत् ॥
 वारिविन्हागमः सम्यक् भवेत्तच्छ्रद्धया व्यधे ।
 संश्लिष्य विहमातनुं योषितुस्तन्मेन कोविदः ॥
 स्थिरे दीपे चले वापि स्वे दयेदक्षि वाह्यतः ।
 सम्यक् शलाकां संस्थाप्याभ्यङ्गैर निलानाशनैः ॥
 शलाकायेण तु ततो निज्जिह्वेद्वटिमण्डलं ।
 विध्यतो योऽन्यं पार्श्वेऽन्नासं वद्धा नासिकापुटे ॥
 उच्छिद्धनेन हस्तं व्यो दष्टिमण्डलजः कफः ।
 निरम इव घर्ष्यायुर्व्यदा दृष्टिः प्रकाशते ॥
 तदासौ लिखिता सम्यग् ज्ञेया याचापि निर्व्यथा ।
 ततो दृष्टेषु रूपेषु शलाकाभाहरण्डनैः ॥

or thin, striated or shinning, painful or red, caused by the deranged humours, the oleaginous applications and fomentations are to be tried first at a time when it is neither hot nor cold; then he (patient) is to be ligatured after having him seated conveniently, and should be directed to look towards his own nose. The intelligent (surgeon), then separating the white part from the black part and the external canthus of the eye after opening it, avoiding the vascular network, and leaving the parts above and below intact, is to pass a yavamukhī śālākā (or sharp needle having its end resembling a wheat) through a natural opening on the side, steadily holding the rod with the thumb, index and middle fingers. If the operation be required on the right eye, the left hand, and if on the left eye, the right hand of the surgeon should use the needle in puncturing. A successful puncture is known by the escape of a drop of fluid and an audible sound. The experienced surgeon is to sprinkle woman's milk just after the puncture, and keeping the needle there, whether the deranged humour be movable or not, should apply fomentations externally by means of oily remedies for the deranged air. The crystalline lens is next to be scarified by the sharp end of the needle. Then keeping the needle fixed in the side of the eye, the patient should be directed to sniff so as to destroy the phlegm of the lens. The proper scarification will be indicated when the lens appears brilliant as the sun uncovered by clouds. Then the vision being clear, the needle in the side of the eye, is to be removed; and the eye is to be well

घृतेनाभ्यञ्ज नयनं पद्मपट्टेन बद्धयेत् ।

ततो मृदे निरावाधे श्यौतोत्तान एव च ॥

soaked with ghee (melted butter) and bandaged properly." Vāgbhata also describes the operation similarly.¹

To this we may compare the account of the operation as given by Celsus. He "lays it down as a rule, that when the suffusion is small, immovable, and of the colour of sea water, or of shinning iron, and if a small degree of light can be perceived at the side, there is reason to hope well of the case. He forbids us to operate until the disease has attained a proper consistence. He directs us to place the patient opposite the operator, who is to sit on a higher seat, while the patient's head

- १ अथ साधारणे काले यदसंभोजिताकनः ।
 दीर्घे प्रकाशे पूर्वार्द्धे भिषग्जानुञ्च पीठनः ॥
 यन्निवस्त्रीपविटस्य श्लिघ्रायस्य मुखानिलैः ।
 अद्भुतं सदिते नेत्रे दृष्टौ दृष्टौतं मलम् ॥
 स्वनासां प्रेक्षमायस्य निष्कम्पं मुग्धं धारिति ।
 ज्ञानादङ्गुलं मुक्ता तदङ्गुलिमपाहतः ॥
 तर्जनीमध्यमाङ्गुष्ठैः शलाकां निधत्ते धृतान् ।
 दैवच्छिद्रं नयेत् पात्रादूर्ध्वमामस्ययन्निव ॥
 सम्यं दक्षिणहस्तेन नेत्रं सज्येन चेतरेत् ।
 विध्येत् सुविधे शब्दः स्यादरुक् चाम्बुलवसृतिः ॥
 सान्त्वयन्नातुरं चानु नेत्रं कान्येन सेचयेत् ।
 शलाकायास्ततोऽप्येष निर्लिखेत्तत्रमङ्गलं ॥
 अबाधमानः शनकैर्नासां प्रतिनुदस्ततः ।
 उच्छिद्यनासापहरेद् दृष्टिमङ्गलं कफम् ।
 स्थिरे दीर्घे चलि चापि स्त्री देवेद्विवाह्यतः ॥
 अथ दृष्टेषु रूपेषु शलाकामाहरेच्छनैः ।
 घृताद्भूतं पितुं दत्त्वा यद्वाचं शाययेत्ततः ॥
 विहादन्त्येन पात्रेन तमुत्तारं द्रव्यैर्व्यधे ।
 निशाते शयनेऽभ्यक्तशिरः पादं हितैरतम् ॥

is held by an assistant. The sound eye is to be previously covered up with wool. If the left eye is affected, the operator must use his right hand, and *vice versa*. A needle which is sharp and not too slender is to be passed direct through the two coats at a place intermediate between the temporal angle and the black of the eye, and towards the middle of the cataract. When the needle has perforated far enough, which is readily known by the absence of resistance, it is to be turned so as gradually to remove the cataract below the region of the pupil and this object being attained it is to be strongly pressed to the lower part. If it remain there the operation is completed, but if it return, it is to be cut and torn by the needle into many pieces, in which state they are easier depressed, and prove less troublesome. The needle is then to be drawn out direct and soft wool smeared with white of an egg, and other anti-inflammatory applications are to be used. Quiet, restricted diet, and soothing treatment will be proper. ¹ Paul ², Mesue ³, Albucasis ⁴, Rhazes ⁵ and others also describe the operation of couching in similar terms. Albucasis gives figures of these needles.

The operation is still practised in India by the māls who consider themselves specialists in diseases of the eyes.

21. SARPĀSYA.

Vāgbhaṭa describes an instrument having its end resembling

¹ Celanus. vi. See Adam's Commentary to Paul VI. xxi.

² Paul. VI. xxi.

³ Mesue. De Aegr. oculi, 15.

⁴ Albucasis. Chirrug, ll. 23.

⁵ Rhazes. Ad manusor.

the mouth of a snake ¹. The blade is said to be half an *añguli* long. It is advised to be used for excision of the nasal and aural polypi.

The fact that it was able to work inside the nose and the auditory canal shows that it could not have been of any great breadth, possibly less than a quarter of an inch at the most. The exact shape of the *sarpāsya* can not be determined with certainty. The Greeks however used for the same purpose, "a polypus scalpel, having its extremity shaped like a myrtle leaf," which was a double instrument, the other end being a scoop ².

GOLD OR SILVER KNIFE.

To cut the navel cord, Caraka ³ recommends the use of a knife, made of gold, or silver, or iron. To make gold and silver knives of sharp edges seems absonous to our reason, but we must remember that to cut the navel cord, a very keen edge is not required, and even now the purpose is often served by the native *dhāis* with a piece of split bamboo.

¹ सर्पांशुं प्राणकर्षांश्चेदनेऽङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

सर्पांशुं नाम शस्त्रमाह । सर्पांशुं इत्यादि सर्पांशुं नाम शस्त्रं नासिका कर्षांशुं छेदने योज्यं तद् फले अङ्गुलादपरिमितं अङ्गुलपरिमितं फलकमित्यर्थः । असा सर्पमुखसदृशं मुखलात् सर्पांशुमिति संज्ञा ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

² Paul. VI. xxv.

³ See foot-note 4. P. 65.

PRATUḌA.

Suśruta mentions it as a knife to be used for making scarifications on the body of a lunatic.¹

The mode of holding the sharp instruments.

Suśruta says²: "The vṛddhipatra is to be held at the junction of the handle and the blade; and all instruments used for incision should be held similarly. The vṛddhipatra and maṇḍalāgra, if used for scarification, should be held with the hand raised a little; when used for evacuating abscesses, they, as well as all other instruments, should be held by the fore part of the handle. But in the case of children, old or delicate or timid persons, women, and kings and princes, abscesses should be evacuated with the trikūrccaka. The vṛhimukha is to be held with the thumb and forefinger, its handle being covered within the palm. The kuṭhārikā is to be held in position with the left hand, and struck with the middle finger when let go forcibly from the under surface of the thumb of the right hand. The ārā, karapatra and eṣaṇī should be held at their extremities.

¹ प्रतुदैर्दारयेत्क्षैनं मध्यंघातं विवर्जयेत् ।

सर्पिंश्चाने जरत्कुपे सततं वा निवासयेत् ॥

Suśruta Saṁhitā, VI. liii.

² तेषामययोगं गृह्यन् समामोपायः कर्त्तव्यो वक्ष्यते । तत्र इन्द्रिपत्रं इन्द्रफलसाधारणे भानि गृह्णीयादेदनाम्बेव सर्वेषां । इन्द्रिपत्रं मण्डलाग्रश्च किञ्चिदुत्तानपाणिना लिखने बहुशोऽवचार्यं इत्यर्थे विस्मावयानि । विशेषेण बालवृद्धमुकुमार भौर नारीणां राज्ञां राजपुत्राणाञ्च विकूर्चकेन विस्मावयेत् । तत्र प्रच्छादित इन्द्रमण्डुक् प्रदेशिनीभ्यां त्रीहिमुखं । कुठारिकां वामहस्तान्यमामित-रहस्त मध्यमाङ्गुल्याङ्गुलि विवर्जयामिहन्वात् । चाराकरपत्रैष्यो मूलैः । शेषाणि तु यथायोगं गृह्णीयात् ।

Suśruta Saṁhitā, I. viii.

The other instruments are to be held as required in particular cases." Vāgbhata also gives similar directions ¹.

The practical training in surgical operations.

Suśruta says ²: "Even after a pupil has mastered the whole of the medical treatises, the preceptor should instruct him practically how to perform surgical operations and how to administer oils and other medicines. However learned he may be in books, he cannot be fit for surgical practice, unless he has acquired the practical training. Therefore the preceptor should show his pupils the methods of operations, of incision, excision and division, upwards and downwards on the pumpkin, bottle-gourds, water-melons, and the three varieties of cucumbers—Trapaṣa (Cucumis Sativus), Ervārūka (Cucumis Utilissimus), and Karkarūka (Cucumis Melo).

१ हिदं भेदेन लिख्याच्चैः शस्त्रं इत्युक्तं फलान्तरे ।
तत्त्वानी मध्याह्नुष्टेभ्यः त्रौदात् सुसमाहितः ।
विस्त्रावणादि इत्यादि तत्त्वैर्बहुष्टके न च ।
तत्र प्रवृत्त इत्यर्थं याज्ञं त्रौहिमुखं मुखे ।
सूक्ष्मशस्त्राणां क्रिया मौक्त्यतोऽपरं ॥

Asāṅga Hṛdaya Saṁhitā. I. xxvi.

* अधस्त सर्वशास्त्रार्थमपि शिष्यं योग्याहारयेत् । क्रियादिषु श्रेयादिषु च कर्मपञ्चमुपदिशेत् । सुबहुश्रुतीयुक्तं योग्यः कर्मस्त्रयोग्यो भवति । तत्र पुष्पफलालावु कालिन्दक-लपुष्पैर्लारुककर्कारुक प्रभृतिषु क्रिया विशेषान् दर्शयेद्भुक्तैः तदपरिकर्तनानि चोपदिशेत् । इति वस्ति प्रसेवक प्रभृतिषु दृक्पङ्कट पूर्णेषु भेद योग्याः । सरोसि चर्मोष्णतमे लिप्पस्य । सत पशुसिरासुत्पलनाक्षिषु च वेधस्य । सुकोपहत काष्ठेण नलनालीयुष्मालावुमुखे वेधस्य । पद्मशविम्बीविलककलमव्यसतपशुदलेष्वाहार्यस्य । मधुच्छिटीपलिने शाकलीफलके विस्त्राव्यस्य । मृण्मयवस्त्रान्तयोर्षट्चर्मालयोश्च मौल्यस्य । पुष्कामय पुरुषाङ्गप्रत्यङ्ग विशेषेषु वन्धयोग्याः । सट्पमांसपेशीषुत्पलनाक्षिषु च कर्णसंश्लिष्वयोग्याः । सट्प मांससंश्लिष्वधिचारयोग्याः । उदक पूर्णचटपार्श्वं शीतस्मालावुमुखादिषु च नेत्रप्रणिधानवस्तिव्यस्य वस्ति पौडन योग्यामिति ।

Suśruta Saṁhitā. I. ix.

The operation of puncturing or tapping may be demonstrated on leather bags, bladders and pouches, filled with slush; scarifications, on stretched pieces of leather covered with hair; opening on the veins of dead animals or on stalks of water-lily; probing on worm-eaten wood, bamboo, reed, tube or dried bottle-gourd; extraction, on the pulp of jack fruit, the Bael fruit (*Ægle Marmelos*), Vimbi fruit (*Cephalandra Indica*) or on the teeth of dead animals. Evacuation on a lump of wax applied to a board of Śālmali wood (*Bombax Malabaricum*); sewing, on the two ends of a thick piece of cloth or soft leather; bandaging on the limbs of a dummy (human figure made of cloth and clay), bandaging the root of the ear, on a piece of soft flesh, or the stalk of a water-lily; application of cauteries, on pieces of flesh; introduction of tubes for clysters (urethral, rectal and vaginal) and wound-syringe, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects."

CHAPTER VII.

THE ANUŚĀSTRA.

The anuśāstra means substitutes for cutting instruments. They are the following¹ :—

1. Bamboo. 2. crystal. 3. glass. 4. ruby. 5. leeches. 6. fire. 7. caustics. 8. the nails. 9. leaves of Goji (*Elephantopus Scaber*), 10. Śephālikā (*Nyctanthe Arbortristis*), and 11. Śākhā (*Tectona Grandis*). 12. young stems of plants. 13. hair. 14. finger.

These are advised to be used in case of infants or timid persons or when the proper instruments are not available.²

1. BAMBOO.

A piece of split bamboo is said to have been used for cutting through and cutting into some parts of the body. It is still used by the native dhāis or midwives for cutting the funis.

A piece of bamboo is directed to be used for applying pressure on small boils to cure them by subsidence³. For the same purpose, the pressure of the thumb is also recommended⁴.

¹ अनुशस्त्राणि तु लकसारस्फटिककाचकुशनिन्दनशीकाप्रिचारनखगौत्रीशेफालिका-
शाकपत्र करीरवालाहृत्पत्र इति ।

Suśruta Saṁhitā. I. viii.

² शिशूनां शस्त्रभीरुणां शस्त्राभावे च योजयेत् ।
लकसारादि चतुर्वर्गे द्वेये भेदे च वृद्धिमान् ॥

Ibid.

³ हतेषु दोषेषु यथानुपूर्व्यं यन्त्री भिषक् श्रेष्ठः समुत्थिते तु ॥
स्त्रिंशसु विस्त्रापनमेव कुर्यादद्भुतलोहोपलवेण दम्बैः ।

Ibid. IV. xviii.

⁴ चम्पज्य स्नेदयित्वा च वेणुनाद्या ततः मूत्रैः ।
विस्त्रापनार्थं मूत्रीयान् तस्मिन्नाद्भुतकेन वा ॥

Cakradatta, Vṛkṣasādhā Cikitsā.

Bamboo is also mentioned to have supplied largely the materials of splints for treatment of fractures and dislocations. For this purpose it is to be split into thin layers¹. Split bamboo is still used for the treatment of fractures by the *kavirājes* and might advantageously be used by the modern surgeons as a cheap and easily available material for splint.

Dissection.

It is generally supposed that the practice of dissection of the human body for anatomical studies was unknown to the ancients. But the practice of human dissection is unmistakably referred to in the *Suśruta Saṁhitā*.² Brushes made of bamboo, barks of trees, grass roots, and hairs are mentioned as instruments of dissection. "Thus a body should be secured which is complete in all the parts and which is of a person who was not more than 100 years old, nor who died from the effects of poison or of a chronic disease. Having cleared the intestines of any faecal matter, the body should be well wrapped either in *Muñja* (*Saccharam Munja*), or grass, or barks of trees or hemp etc., put inside a cage which should be firmly fastened, in a solitary spot, in a calm river and thus allowed to decompose. After seven nights, having taken out

¹ विभग्नश्च नरं दृष्ट्वा वैद्यस्तु न वक्ष्येत् ।

सचवैद्यवनीतनैरक्षपचक्ष वेष्टयेत् ॥

Hārta Saṁhitā, II. I. vi.

² तस्मान्ममसमाचमविषोपहतमदीर्घव्याधिपौडितमवर्षशक्तिं निःसृष्टान्पुत्रौषं पुरुषम-
बहन्त्यामापगायां निवहं पञ्चरस्यं सुखवल्ललकुशशशादीनामन्यतमेनावेष्टिताहमप्रकाशे देहे
कोषयेत् सम्यक् प्रकुण्ठितलोहसूत्रं ततो देहं समराचादुशीरं बालवैद्यं वल्ललं कृचीनामन्यतमेन
अग्नेः शनैरववर्षयेत् क्षतादीन् सर्वानेव वाद्याभ्यन्तराहप्रत्यहं विशेषान् कथीकान् सचवैद्यसुधा ।

Suśruta Saṁhitā, III. v.

the thoroughly decomposed body, it should be slowly rubbed with a brush made either of Uṣīra (*Andropogon Muricatus*) or hair, or bamboo, or barks of trees, examining at the same time with the eyes, every division and sub-division of the body, external or internal, beginning with the skin, as delineated in the śāstras." Animal anatomy was also thoroughly understood as each part of the body had its own distinctive name.

Hoernle¹ says : "Probably it will come as a surprise to many as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising, when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.***Of the practice of such dissection in ancient India we have direct proof in the medical compendium of Suśruta, and it is indirectly confirmed by the statements of Caraka. It is worthy of note, however, that in the writings of neither of these two oldest Indian medical writers is there any indication of the practice of animal dissection."

The Greeks did not practise dissection of the human body. "The anatomical knowledge of the Hippocratists was derived chiefly from dismemberment of animals, experience in slaughtering and sacrifices, and from the observation of surgical cases. Systematic dissection of the human body was out of the question owing to the religious precepts which strictly enjoined immediate burial, and to the superstitious horror of the dead which then prevailed. The supposition that outstanding individual investigators, upon rare occasions, did not hesitate to examine

¹ Hoernle. Osteology. Preface, iii.

human bodies or parts of bodies (particularly) bones, in order to correct prevailing opinions, is one which, if not susceptible of direct proof, is at least probable. This supposition, besides being borne out by many statements on the part of ancient writers, is the more probable since the bodies of savages, traitors and criminals were outside the pale of religious ordinances and were therefore available, as were also accidentally obtained portions of the body, to satisfy the curiosity of scientific investigators. No one of the oft-quoted extracts from the Hippocratic writings, supposed by individual historians to refer to human dissection, is quite conclusive, whilst nowhere is there in the pathology of the day any definite trace of anatomical research upon the bodies of those dead of disease. On the other hand comparisons are frequently instituted by the Hippocratists referring to facts acquired through zootomy or to anatomico-pathological discoveries such as might have been made in the slaughtering of beasts."¹

The study of anatomy received its impetus from the Alexandrian School. "Herophilus improved the technique and developed the terminology of anatomy and enriched it by valuable discoveries made in the dissection of human bodies, particularly in the knowledge of nerves, vessels and viscera, but also in that of the eye. With his works, systematic anatomical investigation may in fact be said to begin."²

"Like Herophilus, Erasistratos made a successful study of anatomy, even surpassing the former in knowledge of details, and in a series of observations upon the cadavers of men and

¹ History of Medicine. Neuberger. P. 150.

² Ibid. P. 177-8.

animals, corrected his own mistakes as well as those of others. His greatest achievement was in the study of nerves and vessels."¹

2, 3 AND 4. CRYSTAL, GLASS AND RUBY.

These are recommended to be used for cutting through and cutting into some parts of the body.

Glass vessels for preparing medicines are often mentioned. Śārāṅgadhara² used it for purifying mercury.

5. LEECHES.

Leeches are described to be the mildest of all means for extracting blood, and are recommended for princes, children, women, and timid people³.

Twelve kinds of leeches are described⁴; six of them are poisonous and six, non-poisonous.

¹ History of Medicine. Neuburger. P. 181.

² काचकृपा विनिरिष्य ताव सवस्त्रमुद्रया ।

विलिष्य परितो वक्तं मूत्रां दत्त्वा च शीघ्रयेत् ॥

Śārāṅgadhara Saṁgraha, II. xii.

³ दृपा बालस्यविर भौरदुर्लभनारी सुकुमारया मनुष्यायं परमसुकुमारोऽयं शोथितावसि च नोपायोऽभिहितो जलौकसः ॥

Śaśrūta Saṁhitā, I. xiii.

⁴ जलमासामाधुरिति जलायुका जलमासामौक इति जलौकसः । ता हादय तासां सविषाः षट् तावत् एव निर्लिषाः । तत्र सविषाः जला कर्जुरा यजगाह्वा इन्द्रायुधा सामुद्रिका गोचन्दना चेति । ताम्रचनचूर्णवशां प्रशुभिराः जला । वस्तिमत्स्वदम्यता क्षिप्रोदत-कुचिः कर्जुरा । रोगशा महापाचां जलमुखलग्ना । इन्द्रायुधवद्गुराजिभिधितिता इन्द्रायुधा । ईषदमितपीतिका विचित्र पुष्पकतिचिता सामुद्रिका । गोष्ठयश्चदधीभानि विषामुताकतिरशुखी गोचन्दनेति । ताम्रिहंटे पुरुषे दंशे अयस्वरतिमानं कर्जुमुखां

The poisonous leeches are :—

1. Kṛṣṇā:—it is of the colour of black collyrium and has a broad head.

ज्वरोदाहृष्टहिंसदः सदनमितिलिङ्गानि भवन्ति । तत्र महानदः पानाक्षिपननस्य कर्मादियूप-
योऽयः । इन्द्रायुधादष्टमसाध्यमित्येताः सविषाः सचिकित्सिता व्याख्याताः । अथ निर्विषाः ।
कपिला पिङ्गला शङ्कुमुखी मूषिका पुष्परीकमुखी सावरिकाचेति । तत्र मनःशिलारजिता-
भ्यामिव पाशाभ्यां पुनरेच्छिन्मसृङ्गवर्णा कपिला । किञ्चिद्रक्ता इत्यकाया पिङ्गायमात्रं पिङ्गला ।
यज्ञवर्णा शीघ्रपायिनी दीर्घतौक्ष्णमुखी शङ्कुमुखी । मूषिकाकृति वर्षाऽनिष्टनम्या च मूषिका ।
सृङ्गवर्णा पुष्परोक्तुल्यवक्त्रा पुष्परीकमुखी । द्विगुणा पद्मपत्रवर्णाष्टादशाङ्गुलप्रमाणा सावरिका
सात्र पञ्चर्षे । इत्येता अविषा व्याख्याताः ।

तासां प्रयङ्गुमार्द्रचर्मस्थानैर्वा प्रयोमेष्टुंहीयात् । अथेनां नवे महति घटे सरसज-
गोदकपङ्कमावाप्य निदध्यात् । भल्यार्षे चासामुपहरेच्छैवलं बहुरमौदकांश्च कल्पा-
यूर्णोक्तव्यं शय्यार्षे ढण्मौदकानि च पत्राणि । इहाह्वाहाचान्यम्लं भल्यश्च दद्यात् ।
सतरावात् सतरावाच्च घटमन्यं संक्रामयेत् । भवति चाथ ।

मूलमध्याः परिक्रिताः पृथो मन्दविचेष्टिताः ।

अशाङ्किण्योऽल्पपायिन्यः सविषाश्च न पूजिताः ॥

अथ जलीकोऽवसेकसाध्यव्याधितमुपवेष्टुं संवेष्टुं वा विरुह्य चास्य तमवकारं सङ्गीमव-
चूर्णैर्वयस्कजः स्यात् । गृहीताथ ताः सर्पपरजनौकल्कोदकं प्रदिग्धगावीः सलिलसरकमध्ये
सुश्रुतस्थिताविगतकृमा ज्ञात्वा तामीरीमं ग्राहयेत् । एकयस्माद्रपिपुत्रोदावच्छत्रां कृत्वा
मुखमपाङ्गुयादगृह्णन्त्ये चौरविन्दुं शोणितविन्दुं वा दद्याच्छलपदानि वा कुर्वीत यथेवमपि न
गृह्णीयात्तदानीं ग्राहयेत् । यदा च निविशतेऽश्मुरवदान्नं क्लोत्रस्य च स्क्लं तदा
जानीयाद् गृह्णातीति गृह्णन्तीं चार्द्रवस्त्रावच्छत्रां धारयेत् संचयेत् । दंशे तोदकन्दुमादुर्भा-
वैर्जानीयाच्छुद्धमिमादत्त इति गृह्णमाददानामपनयेत् । अथ शोणितगन्धेन न सुच्छेऽसुखमस्त्राः
सैन्धवचूर्णेनावकिरेत् । अथ पतितां तण्डुलकण्डनप्रदिग्धगावीं तैलस्रवणाम्भक्तमुखीं वान-
हसाङ्गुठाङ्गुलीभ्यां गृहीतपुच्छां दक्षिणहस्ताङ्गुठाङ्गुलीभ्यां शनैः शनैरनुलीनमनुनाच्येद-
सुखाशामयेत्तदद्यात्सम्यग्वानलिङ्गानीति । सम्यग्वान्ता सलिलसरकमस्त्रा भोतुकामा सती
चरेत् । या सौदति न चैष्टे सा दुर्जाना तां पुनः सम्यग्वामयेत् । दुर्जानाया व्याधिर-
साध्यइन्द्रमदो नाम भवति । अथ सुवतां पूर्ववत् सन्निदध्यात् शोणितस्य च योगयोगानवेद्या
जलीकोत्रणाङ्गुलनावष्टयेच्छीताभिराङ्गिष्य परिवेषयेवञ्चीत वा व्रणं काषायं मधुरं श्लिग्मयौतैश्च
प्रदेष्टेः प्रदिष्टादिति ।

2. *Karvūrā*:—it is as long as an eel with elevated stripes across the abdomen.

3. *Alagarddā*:—it looks as if covered with hair and has large sides and black mouths.

4. *Indrāyudhā*:—or rain-bow coloured; it has rain-bow coloured longitudinal stripes on the back.

5. *Sāmudrikā*:—it is of dark yellow colour and has variegated flower like spots on its body.

6. *Gocandanā*:—it has a bifurcated tail like the scrotum of a bull and a small mouth.

The non-poisonous ones are—

1. *Kapilā* or the greenish one;—it has its two sides of the colour of orpiment, and on its back, it is smooth and of the colour of a green pea.

2. *Piṅgalā* or twany;—it is of a reddish-brown colour, has a round body and moves quickly.

3. *Śaṭku-mukhī* or bluish-red;—it is of the colour of the liver, sucks quickly and has a long sharp mouth.

4. *Mūṣikā* or rat-like;—it has the shape and colour of a rat's tail and emits a disagreeable smell.

5. *Pundarika-mukhi* or lotus-faced;—it is of the colour of a green pea and has a mouth like a lotus.

6. *Savarikā*;—it is slimy, coloured green like a lotus-leaf and eight angulil long; it is to be used in veterinary practice.

The non-poisonous leeches generally live in meadows and fresh water. They are to be caught with a piece of wet leather and

kept in a new large earthen pot filled with mud, water, green fungi, dry flesh, etc. The water is to be changed every third day and the pot every seventh day.

To apply leeches, the patient is directed to lie down and the part is to be rubbed dry with powdered cow dung and earth. The leech is then to be smeared with a paste containing turmeric, mustard and water, to excite them, washed thoroughly with water and then applied, its body being covered with a piece of wet cloth. To fix it quickly, a drop of milk or blood is to be applied over the diseased part, scarification of which is also recommended instead. When the leech has removed the necessary quantity of blood, a small quantity of salt is advised to be sprinkled upon its head to make it drop off. Then the leech is to be put upon some powdered rice and its mouth is advised to be smeared with oil and salt.

Then it is to be stripped and put in fresh water, and should be used again, if it moved, but if languid, thrown away.

The leech-bites are to be smeared with honey, cold water and astringent substances, or poulticed.

Vāgbhaṭa also gives similar directions for the application of leeches.¹

- ¹ जलीकमनु मुखिनो रक्तसावाय योजयेत् ।
 दृष्टाम्बुसत्त्वा भेकादि शक्तीवमतीहवाः ।
 रक्ताः वेता भृशं कणाद्यपत्ताः स्यूतपिच्छिलाः ॥
 इन्द्रायुधविचित्रोद्देराजयो रोमशाथ ताः ।
 मविद्या वर्धवेताभिः कण्टुपाकं ज्वरममाः ॥
 विषपित्तासनुन् कार्थे तव ग्रहाम्बुजाः पुनः ।
 निर्विषाः श्रेयलम्बावा हता नीलदेराजयः ॥

Dr. Ray has clearly shown that "the discription of leeches as given by Rhazes agrees almost word for word with that of Suśruta (Sanasrad) in many places". He describes the parallelism at length and comes to the conclusion "of the use of a chapter of the Susruta or some such work".

6 AND 7. FIRE AND CAUSTICS.

The use of cauteries in surgery has been described before under the head of the accessory blunt instuments ².

कषाय वृद्धान्वहः किञ्चित् पीतदराय वाः ॥
 ता अथसम्यग् वननात् प्रततच्च निपातनात् ।
 सौदनीः सलिलं प्राप्य रक्तमला इति त्वजेत् ॥
 अथेतरा निशाकल्क पुत्रेऽश्वसि परिप्लुताः ।
 अवन्तिसेमि तक्षेवा पुनश्चावसिता जले ॥
 लासवेद घृतमन्त्राङ्गं शस्त्रं रक्त निपातनेः ।
 पित्तनीयन्नहतं कृत्वाऽहोदयेन्मृदुवाससा ॥
 संशुक्राङ्गुटं वृद्धास्त्रालौका दृष्टमोक्षितम् ।
 आदत्ते प्रथमं हंसः सौरं सौरोदकादिव ॥
 दंशस्य तोद्रे कम्पुर्वा वा मोचयेद्दामदेव ताम् ।
 पटुतैलात्तवदनो श्लेष्म कम्पनं कञ्चित्ताम् ॥
 रचन् रक्तमदाहं भुयः सप्ताहं वा न पातयेत् ।
 पूर्व्वेवत् पटुता दाहं सम्यग् वान्ते त्रलीकसात् ।
 क्रमोऽतियोगाश्चतुर्वा दुर्बान्ते लम्बता मदः ॥
 अन्वतान्व वा ताः स्वाया घटे सत्स्नान्मृगर्भिनि ।
 लाक्षादिकोय नामाद्यं सविधाः सुगन्धदन्वान् ॥
 अथहो साधयेद्दंशान् हरिद्रा गुडमाचिकेः ।
 शतधीताभ्यपिचवसतो क्षेपाय शीतलाः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

¹ History of Hindu Chemistry, Introduction P. Ixviii.

² See Page 213-4.

8 AND 14. FINGERS AND NAILS.

The uses of surgeon's fingers and nails in surgical operations has been described before¹.

9,10 AND 11. LEAVES.

Rough leaves such as those of Fig trees (*Ficus Indicus*), Goji (*Elephantopus Scaber*), Śephālikā (*Nyctanthes Arbor-tristis*) and Śaka (*Tectonia Grandis*) are recommended for scarifying abscesses if they do not heal up after repeated opening by the knife. If there is any formation of pus in the mouth or eyelids, it may be evacuated with these leaves (*Susruta*)². These leaves are also to be used for bleeding the gums in gingivitis.

To cover the wounds, *Suśruta* gives a list of leaves to be used according to the nature of the wound and season of the year³ :—

For air-deranged wounds;—use leaves of Erāṇḍa (*Ricinus Communis*), Bhūrjapatra (*Betula Bhojpatra*), Pūtika (*Caesalpinia Bonducella*) and Haridrā (*Cureuma Longa*).

¹ See Page 199-202, and 204-5.

² मंशोष्णीभवतः कार्यं निरसोप कृते तथा ।
काकोडुम्बरिका मोजीपवेक्षिस्वावर्धदसक् ॥

Suśrutā Saṁhitā, IV. xxii.

³ परस्म भूर्जपूतीक हरिद्राणाम् वातजे ।
पचमाश्वत्थं यच्च काशतरो पतमेव च ॥
पताणि चौरहचाणामौदकानि तथैव च ।
दूषिते रक्तपित्ताभ्यां जले दद्याद्विचक्षणः ॥
पाठान्त्र्यांगुडूचीनां काकनाचीहरिद्रयोः ।
पक्वञ्च शुक्रनाशयो धोजयेत् कफजे जले ॥

Ibid, IV. i.

For bile or blood-deranged wounds;—use leaves of *Āśvabala* (*Basella Rubra*), *Kāśmarīpatra*, (*Gmelina Arborea*), *Vata* (*Ficus Bengalensis*) and *Kumuda* (*Nymphae Lotus*).

For phlegm-deranged wounds—use leaves of *Pāṭhā* (*Cisampelos Hexandra*), *Mūrvā* (*Sansevieria Zeylanica*), *Guḍuḥī* (*Tinospora Cordifolia*), *Kākamācī* (*Solanum Nigrum*), *Haridrā* (*Curcuma Longa*) and *Śuknāśā* (*Oroxylum Indicum*).

For similar purpose Caraka¹ recommends us to use the leaves of *Kadamva* (*Anthocephalus Cadamba*), *Arjuna* (*Terminalia Arjuna*), *Nimva* (*Azadirachta Indica*), *Pātālī*, *Pippala* (*Ficus Religiosa*) and *Arka* (*Calotropis Gigantea*).

The leaves of the *padma* or *nymphae* are to be used for handling the eyeballs and the intestines, to replace them in their proper position when prolapsed by injury² (*Suśruta*) Caraka recommends lotus leaves and plantain leaves as coverings to the bleeding piles,³ Cakradatta⁴ mentions the use of

¹ कदम्बार्युननिम्बानां पाटल्याः पिप्पलस्य च ।

त्रयं प्राक्छादये विद्वान् पत्राण्यर्कस्य चादिशेत् ॥

Caraka Saṁhitā, VI. xiii.

² भिन्नं नेतमकर्मण्यमभिन्नं लम्बते तु यत् ।

तन्निवेश्य यथास्थानमन्याविहगिरं शनैः ।

पौडवेत् पाणिना सन्त्यक् पद्मपत्रान्तरेण तु ॥

Suśruta Saṁhitā, IV. li.

³ कदलीदलेरभिनवेः पुष्कर पत्रेण शीतजलमिर्कैः ।

पञ्चादनं मुहूर्ध्वं हरिः पद्मोत्पलदलेष ॥

Caraka Saṁhitā, VI. ix.

⁴ गोजीशकालिका पत्रेणः संलिप्य लेपयेत् ।

क्षरेण वाक्शतं तिष्ठेद् यन्तदारं पिपाश च ॥

Cakradatta, Arśa Cikitsā.

Gojī and Śephālikā leaves for scratching the piles before the application of caustics to them. He also directs us to rub the small tumours with the rough leaves before the application of various ointments.¹ Śivodāsa also mentions the use of such leaves for rubbing the eyelids in the pillva disease.² Suśruta³ mentions the use of rough leaves for scratching any part.

Paul⁴ mentions the use of fig leaves, for rubbing down the hard granulations of granular lids.

12. YOUNG STEMS OF PLANTS.

The young shoots are described to have served the purpose of a probe. Caraka⁵ calls them the soft variety, the metallic ones being called the hard probes. These shoots are to be used for superficial sinuses. Suśruta directs us to use the young shoots

- ¹ विष्टय चोदुम्बरगाकगोजी-
पतेभृशं चौद्रयुतेः प्रलिम्बेत् ।

Cakradatta, Granthayarvada Cikitsā.

- ² वल्कावलेखं बहुशस्तद्वच्छोषितमीषणम् ।
पुनः पुनर्विरक्तं पित्तरोगातुरो भजेत् ॥

Cakradatta, Netraroga Cikitsā.

- वल्कावलेखनिति । कर्कशशालोटकादि पतेषु वर्त्मवर्धणम् ।

Tattva Candrikā, Ibid.

- ³ चोमं शीतं पिबुं केन वावयुजं समैश्वरं ।
कर्कशाणि च पानाणि लेखनार्थं प्रदापयेत् ॥

Suśruta Saṁhitā, IV, i.

⁴ Paul, III, xxii.

⁵ See foot-note 4. P. 269.

of the pot-herbs called Cuñca and Upālikā (*Basella Rubra*) as probes in sinuses on the eyelids and around the anus.¹

If in young people the teeth become loose as the result of some injury, the patient should be directed to live upon milk only, sucking it through the stalk of lily; and thus affording the teeth rest and a chance of being firmly fixed again.²

To excite emesis, Śārṅgadharma,³ advises us to introduce a tube of *Eraṇḍa* (*Ricinus Communis*) into the throat of the patient. The vomiting is also said to have been excited by thrusting a finger or a stalk of lily down the throat.

- ¹ नाडी व्रणान् शल्यगर्भानुन्मास्युत्सृजिनः शनैः ।
करिरवाङ्गुलिभिरेषया वैषयेद्विषक् ॥
नेत्रवर्कगुदाभ्यासनाद्योऽवकाः शोणिताः ।
पुष्पौदकजैः शूलैः कुरीरैरेषयेत्तृताः ॥

Suśruta Saṁhitā, IV. i.

- ² अमघाश्लितान्दनान् मरुतानवपीडयेत् ।
तरुणस्य मनुष्यस्य शीतैरालिपयेद्विष्टः ॥
सिक्ताभ्युमिश्रितः शितैः सन्ध्याऽथैरुपाचरेत् ।
उत्पलस्य च नालिन्यौ (पालं) विधौयते ॥

Suśruta Saṁhitā, IV. iii.

- ³ अजीर्णं कोणपानीयं सिन्धु पीत्वा वमन् सुधोः ।
वमनं पाययित्वा च आनुमात्रासनैः स्थितम् ॥
कण्ठदीर्घज्जनालेन स्पर्शनं वामयेद्विषक् ।
अनृष्टं वमतः पुंसः पार्श्वौ द्वौ च प्रक्षोषयेत् ॥

Śārṅgadharma Saṁgraha, III. iii.

CHAPTER VIII.

HYGIENIC APPLIANCES AND HOSPITAL REQUISITIES.

TOOTH-BRUSH.

The ancient Hindus used branches of trees as tooth-brush. They should have the length of twelve *anguli* and the circumference equal to that of the little finger. *Suśruta* directs us to use a straight and plain branch of such trees as have an astringent, or sweet, or bitter, or sour taste¹. Amongst these classes of trees, the twigs of *Khadira* (*Acacia Catechu*), *Madhuka* (*Brassia Latifolia*), *Nimba* (*Melia Azadirachta*), *Karñja* (*Pongamia Glabra*) are the best. The end of the stick is to be chewed first to form a brush and the teeth are then to be rubbed with it. He recommends us to use some tooth-powder.²

- ¹ तत्रादौ दन्तपवन । दशाङ्गुल मायते ।
कनिष्ठिका परिणाष्ट सन्ध्यधितमग्रार्थं ॥
अयुष्मन्नि यथापि प्रत्यरे यस्तस्मिन्निर्जं ।
अवेत्यर्त्तुच्च दीपच्च रसं बीर्यञ्च योजयेत् ॥
कषार्थं मधुरं तिक्तं कटुकं प्रातरुत्थितं ।
निम्बश्च तिलकं श्रेष्ठः कषार्थे खदिरस्तथा ।
मधुकौ मधुरं श्रेष्ठः करञ्चः कटुके तथा ॥

Suśruta Samhitā, IV. xxiv

- ² चोद्रे व्योष तिवर्गाङ्गं सुतैले सैन्धवेन च ।
चूर्णेन तेजोवत्याश्च दन्ताग्निस्थं विशोधयेत् ॥
एकैकं धर्षयेद्दन्तं मृदुना कूर्चकेन च ।
दन्तगोधनं चूर्णेन दन्तमांसन्यबाधयन् ॥

Bhāvamiśra mentions the names of other trees which may be used for the purpose,¹ and also gives us a list of trees to be avoided.² The use of the tooth-brush is contra-indicated in the various diseases of the mouth, ears, &c.³ Caraka⁴ advises us to use the tooth-brush twice a day.

- १ चङ्गे जीर्णं वटे दीतिः करञ्चे विजयो भवेत् ॥
 उले चैवाक्षसम्पत्तिर्वदयो मधुरोधनिः ।
 खदिरं सुखमौगन्धा विधेत् विपुलं धनम् ॥
 उदुम्बरे तु वाक्सिद्धिराक्षारोग्यमेव च ।
 कदम्बे तु धृतिर्मेधा चम्पके च हृदयमतिः ॥
 शिरीषे कौर्त्तिमौभाग्य मातुरारोग्यमेव च ।
 अपामार्गे धृतिर्मेधा प्रज्ञाश्चक्षुःश्रोत्राणि ॥
 दाहिण्यां सुन्दराकारः ककुभे कुटजे तथा ।
 जातीतमरमन्दारैर्दुःस्मिन् विनश्यति ॥

Bhāva Prakāśa, I. i.

- २ गुवाकम्नालहिनाली केतकश्च उहतृण ।
 खर्जूरं नारिकेरञ्च सवैते वृषराजकाः ॥
 वृषराजं समुत्पन्नं यः कुर्याद् दन्तधावनम् ।
 नरयाज्जालं धीनिः स्नादयावद्दङ्गाश्च पश्यति ॥

Ibid.

- ३ मलादिदग्धतान्त्रोष्ट जिह्वारोगं समुत्पे ॥
 अथास्त्रपाकि दासेच कामक्षिका वनीषु च ।
 दुर्बलो जीर्णं भक्ष्य मूर्च्छार्त्तमिददीहितः ॥
 शिरोरुमारुतशृपितः शालः पानकमान्वितः ।
 चर्द्धिती कर्चगुलीच दन्तरोमीच मानवः ॥

Saṁhita Saṁhitā, IV. xxiv

- ४ आपोयितासं शी काली कषायं कटुतिक्तकम् ।
 भक्षयेद्दन्तपक्वं दन्तसंस्थान्वाधयन् ॥
 निहन्ति गन्धवेरसं जिह्वादन्तास्त्रजं मण्डम् ।
 निष्कृष्य रुचिमाधत्ते सद्यो दन्तविशोधनम् ॥

Caraka Saṁhitā, I. १.

Suśruta mentions the use of a tooth-brush to extract a fish-bone from the throat.¹

After cleansing the mouth with water after meals, I'Tsing ordains² "Chew tooth-wood in the mouth; let the tongue as well as the teeth be carefully cleaned and purified." Again he says: "It is surely not seemly for any one to spend his time after meals chaffing and chattering, nor is it right to remain impure and guilty all day and night, without preparing water in a clean jar or without chewing a tooth-wood."

He continues³: "Every morning one must chew tooth-woods, and clean the teeth with them, and rub off the dirt of the tongue as carefully as possible. Only after the hands have been washed and the mouth cleansed is a man fit to make a salutation; if not, both the saluter and the saluted are at fault. Tooth-wood is *Danta-kāṣṭha* in Sanskrit—*danta*, tooth, and *kāṣṭha*, a piece of wood. It is made about twelve finger-breadths in length, and even the shortest is not less than eight finger-breadths long. Its size is like the little finger. Chew softly one of its ends, and clean the teeth with it. If one unavoidably come near a superior, while chewing the woods, one should cover the mouth with the left hand.

Then breaking the wood, and bending it, rub the tongue. In addition to the tooth-wood, some tooth-picks made of iron or copper may be used or a small stick of bamboo or wood, flat as the surface of the little finger and sharpened on one

¹ मृदना वा दन्तधावनकुर्वन्केनापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

² I'Tsing. Records of the Buddhist Religion.—Takakusu. P. 26-7.

³ Ibid. ch. viii. Use of Tooth-woods. P. 33.

end, may be used for cleaning the teeth and tongue ; one must be careful not to hurt the mouth. When used, the wood must be washed and thrown away.

Whenever a tooth-wood is destroyed, or water, or saliva is spit out, it should be done after having made three fillips with the fingers or after having coughed more than twice ; if not, one is faulty in throwing it away. A stick taken out of a large piece of wood, or from a small stem of a tree or a branch of an elm, or a creeper, if in the forest ; if in a field, of the paper mulberry, a peach, a *sophora japonica* (Huai), willow tree, or anything at disposal, must be prepared sufficiently beforehand. The freshly cut sticks (lit. wet ones) must be offered to others, while the dry ones are retained for one's own use.

The younger priest can chew as he likes, but the elders must have the stick hammered at one end *and made soft* ; the best is one which is bitter, astringent or pungent in taste, or one which becomes like cotton when chewed. The rough root of the Northern Burr-weed (Hu Tai) is the most excellent ; this is otherwise called Tsang-urh or Tsae-urh, and strikes the root about two inches in the ground. It hardens the teeth, scents the mouth, helps to digest food, or relieves heart-burning. If this kind of tooth-cleaner be used, the smell of the mouth will go off after a fortnight. A disease in the canine teeth or toothache will be cured after a month. Be careful to chew fully and polish the teeth cleanly, and to let all the mouth-water come out ; and then to rinse abundantly with water. That is the way. Take in the water from the nose once. This is the means of securing a long life adopted by Bodhisattva *Nāgārjuna*. If this be too hard to put in practice, to drink water is

also good. When a man gets used to these practices he is less attacked by sickness. The dirt at the roots of the teeth hardened by time must all be cleaned away. Washed with warm water, the teeth will be freed from the dirt for the whole of life. Tooth-ache is very rare in India owing to their chewing the tooth-wood."

TOOTH-PICK.

Suśruta advises us to use sticks of grass as tooth-pick after meals to extract particles of food lodged between the teeth, otherwise these will decompose and the mouth would be smelling badly.¹ Bhāvamīśra gives similar directions but adds that if any particles of food cannot be easily extracted by the tooth-pick, one must not use any force to extract them.² "After eating they cleanse their teeth with a willow stick, and wash their hands and mouth."³

JIHVĀ NIRLEKHANA OR TONGUE SCAPER.

Suśruta says: "To scrape the tongue, a golden, or silver, or

¹ दन्तान्तरगतं चान्नं शोधनेनाहरेच्छनैः ।
कुप्यादनाहतं तद्धि मुखस्यानिष्टगन्धताम् ॥

Suśruta-Saṁhitā, I. xlv.

² एवं भृक्षा मसावामिदुचयदण पूज्यं कम् ।
भीजने दन्तलघ्नानि निर्हन्वाचमनं चरेत् ॥
दन्तान्तरगतं चान्नं शोधनेनाहरेत् शनैः ।
कुप्यादनिर्हृतं तद्धि मुखस्यानिष्ट गन्धताम् ॥
दन्तलघ्नमनिर्हृत्यै सिद्धं भवेत् दन्तवत् ।
न तत्र बहुशः कुप्याद यत्र निर्हरणं प्रति ॥

Bhava Prakash, I. i.

³ Beal's Records of the Buddhist Religion. Trans. from Hsiao Tsiang, vol. I, p. 77.

wooden scraper is to be used. It should be ten *añguli* long and must be pliant and polished"¹. Caraka² mentions tongue-scraper of copper, lead or brass. Bhāvamitra³ also gives a similar description. It is to be used for scraping the deposit on the tongue. It is still commonly used in India.

RAZOR AND SHEARS. THE PRACTICE OF SHAVING.

Every one is recommended by Suśruta to have his beard shaved, hair trimmed and nails pared.⁴ Caraka⁵ also advises

¹ जिह्वानिलेखनं रीण्यं सीवणं चार्धमेव च ।

तन्मालापरं शनं सदृशञ्च दशाङ्गुलं ॥

Suśruta Saṁhitā, IV. xxiv.

² मुखशुद्ध्यताम्राणि वपुरीतिमयानि च ।

जिह्वानिलेखनानि स्युरतीच्छाम्यशूनि च ॥

जिह्वामूलगतं यच्च मलमुष्णसरोधि च ।

सौरभ्यं भजते तेन तथाज्जिह्वां विनिर्लिखेत् ॥

Caraka Saṁhitā, I. v.

³ जिह्वानिलेखनं वैभं राजशं ताम्रं तथा ॥

पाटितं सदृ तत् काष्ठं सदृपत्रमयं तथा ।

“तत्काष्ठं” दन्तशोधनयोग्यं काष्ठम् ।

दशाङ्गुलं सदृ खिग्धं तेन जिह्वां लिखेत् मुखम् ।

तच्चिह्वा मलवैरस्य दुर्गन्धं जड़ता हरम् ॥

Bhāva Prakāśa, I. i.

⁴ पापीपशसनं केशनखरोमापमाञ्जनं ॥

हृष्यलाघव-सौभाग्य-करमुत्साह वर्धनं ।

वाणवारं सजावणं तेजोबलं चिबर्धनं ॥

Suśruta Saṁhitā, IV. xxiv.

तवादित एव नीचनखरोद्या

* *

Ibid.

⁵ पीटिकं वृषमायुष्यं शुचिरुपविराजनम् ।

केशशृणुनखादीनां कल्पनं संश्लेषनम् ॥

Caraka Saṁhitā, I. v.

us to shave regularly, that is thrice in a fortnight.¹ Bhāvamīśra says that this practice conduces to health, beauty, longevity and purity, and should be observed every fifth day². Razor is mentioned in the R̥gveda³ and in the Kaṭhapaniṣad of the White Yāyū.⁴ In the Śatapatha Brāhmaṇa, we find the method of shaving well described.⁵ "Then (in shaving) are used a porcupine quill spotted in three places and a copper razor; that three-spotted porcupine's quill resembles the three-fold science and the copper razor resembles the Brāhmaṇa; for Brahmā is fire, and fire is of reddish (lohita) colour, hence a copper (loha), razor is used".

Again we read⁶:—"For impure, indeed, is that part of man where water does not reach him. Now at the hair and beard, and at the nails the water does not reach him; hence when he shaves his hair and beard, and cuts his nails, he does so in order that he may be consecrated after becoming pure.

¹ विः पचस्व केशम्नयुलोमनखान् संहारयेत् ।

Carakas Saṁhitā, I. viii.

² पञ्चरात्रादयस्त्रयस्त्रयकेशरोमाणि कर्तव्येत् ।

केशम्नयु नखादीनां कर्तनं सम्यसाधनम् ।

पौष्टिकं धन्यमायुष्यं शौचकान्तिकरं परम् ॥

"सम्यसाधनम्" शौभाजनकम् ॥

Bhāva Prakāśa, I. i.

³ सं नः शिशोहि भुरिजोरिव चुरंराक्षरायो विमोचन ।

R̥gveda, 8 M. 4 S. 5 A. 7 A. 16 V.

⁴ चूरस्व धारा निशिता दुरव्यय दुर्मन्यवस्तत् कथ्यो वदन्ति ।

Kaṭhapaniṣad, I. iii.

⁵ Śatapatha Brāhmaṇa, II. 6. 4. 5.

⁶ Ibid. III. 1.2.2.

3. Now some shave themselves all over, in order that they may be consecrated after becoming pure all over; but let him not do this. For even by shaving the hair of his head and his beard, and by cutting his nails he becomes pure; let him therefore shave only the hair of his head and his beard, and cut his nails.

4. In the first place he cuts his nails, first of the right hand, for in human (practice) those of the left hand (are cut) first, but with the gods in this manner. First he cuts those of the thumb—for in human practice those of the little fingers are cut first, but with the gods in this manner.

5. He first passes (the comb) through his right whisker—for in human (practice they comb) first the left whisker, but with the gods in this manner.

6. His right whisker he moistens first with the text "may this divine water be propitious unto me".....

There upon he lays a stalk of sacrificial grass on (the hair of the whisker) with the text "O plant, protect me"..... Thereto he applies the razor, with the text "O knife, injure him not".

8. Having cut off (part of the stalk and hair), he throws it into the vessel of water. Silently he moistens the left whisker; silently he lays the stalk of grass on it; and having silently applied the razor thereto and cut through (it and the hair) he throws them into the vessel of water.

He then hands the razor to the barber, and the latter shaves off the hair and beard. When he has shaved the hair and beard.....

10. He bathes.....

12. He steps out (from the water) towards the north-east, with the text "cleansed and pure I go forth from them;".....

13. He then puts on (a linen) garment etc."¹

"The Atharva-veda relates how, when the ceremony of shaving off his beard was performed on king Soma, Vāyu brought the hot water and Savitrī skillfully wielded the razor."²

In para. 3, quoted above, we have evidence of the practice of depilation of the pubes which is here forbidden. There are six important rules and six minor rules of ordination for the female members or Śramaneris of the Buddhist order. One of the six minor rules is : A female must not shave the hair in any place but the head.³ "Aristphanes, a contemporary of Hippocrates,⁴ Persius⁵ and Juvenal⁶ refers to the depilation of the pubes as being common among certain classes, and the early Christian Fathers deplore the practice. See also the remarks of Suetonius on the conduct of Domitian⁷. Prosper Alpinus (16th century) "found the custom still prevalent among the Egyptian women"⁸. "The custom survived in France, and Italy in the 16th century"⁹.

KEŚA PRASĀDHANĪ OR COMB.

Suśruta directs us to comb the hair to free the head from dust,

¹ Macdonnell's Sanskrit Literature, p. 164.

² See ITsing, P. 97, Foot-note 3. Vinaya Saṁgraha. Chap. xii.

³ Hippocrates, Ban. 516, Lys 89. 151.

⁴ Persius, iv. 37.

⁵ Juvenal, vii. 114.

⁶ Suetonius, xxii.

⁷ Medicina Aegyptiorum, III. xv.

⁸ Milne, Surgical Instruments &c., p. 90-91.

louse and dandruff.¹ Bhāvamiśra advises us to comb the hair every day to keep it clean, as it stimulates the growth of hair.² Caraka³ also recommends us to keep the hair clean. The practice of combing the hair is very ancient; the Atharva-veda mentions a comb with a hundred teeth.

LOOKING-GLASS.

The looking-glass should be constantly used as thereby the complexion is said to be improved and life prolonged⁴. For an account of the looking-glass of the ancient Hindus, see Mitra's Indo-Aryans⁵.

DRESS.

Silk, chintz and red clothes are good for the winter, for they are said to be useful for derangement of air and phlegm. Thin silk is cooling and is efficacious for biliary disorders; so it should be used during the summer. It should be coloured twany or red. White clothes are auspicious and are neither hot

¹ केशप्रसाधनी केशा रजोजन्तु मलापहः ।

Suśrutā Saṁhitā, IV. xxiv.

² केशपाशे प्रकुर्वीत प्रसाधना प्रसाधनम् ।

केश प्रसाधनं केश रजोजन्तु मलापहम् ॥

Bhāva Prakāśa, I. i.

³ माधूकेशः प्रसाधितकेशो * * *

Caraka Saṁhitā, I. viii.

⁴ आदशोन्मीकनं प्रोक्तं माण्डव्यं कान्तिकारकम् ।

दीप्तिकं कल्याणायुष्यं पापलक्ष्मी विनाशनम् ॥

Bhāva Prakāśa, I. i.

⁵ The Indo-Aryans Vol. 1, p. 240.

nor cold; therefore they should be worn during the rains¹. Caraka says that pure dress conduces to longevity, happiness and fortune².

UṢṢĪṢA OR HEAD DRESS.

Suśruta³ advises us to use a cap on our head which is thus protected from injury. Bhāvamiśra says that the habitual use of some form of covering for the head stimulates the growth of hair, increases beauty of the head and protects it from dust, draughts and accumulation of phlegm. Only light caps should be used as the heavy varieties derange bile and cause diseases of the eyes.⁴ For the diagrams of the various forms of turbans used by the ancient Hindus, see Mitra's Indo-Aryans.⁵

- १ कोशेयौर्ध्वं क वस्त्रं रक्तवस्त्रमेव च ।
 वातघ्नं हस्ति शीतकाले विधाययेत् ॥
 “कोशेयं” पशाम्बरं चमरवस्त्रं ।
 मध्यं सुशीतम्पित्तं कषायं वस्त्रमुच्यते ।
 तद्वारयेदृणकाले तत्रापि लघु वस्त्रं ॥
 कषायहीनकटौ इति लोके, कषायं रागरक्तं वा ।
 यज्जन्तु यमदं वस्त्रं शीतातप निवारणम् ।
 नवीचद्रववा शीतान्तु वर्षासु धारयेत् ॥

Bhāva Prakāśa, I. i.

- २ काम्यं यशस्वमायुष्यमलक्ष्मीं प्रदध्वंशम् ।
 नीमन्तु पारिषदं शस्त्रं निर्मलाम्बरधारणम् ॥

Caraka Saṁhitā, I. v.

Bhāva Prakāśa, I. i.

- ३ पवित्र किंशुचीयं वातातपरजोऽपहं ।

Suśruta Saṁhitā, IV. xxiv.

- ४ तृचीयं कान्तिरुत्कृष्टं रजोवात कफापहम् ।
 लघु तच्छस्त्रं यच्चाह दृश पित्ताविरोरुहम् ॥

Bhāva Prakāśa, I. i.

- ५ The Indo-Aryans, Vol. I, p. 220.

CHATRA OR UMBRELLAS.

Suśruta says: Umbrellas are useful for protecting men from the rains, draughts, glare of the sun, exposure to cold, and dust. They are auspicious and are beneficial to the eyes¹. Caraka² advises us to use it as it protects us from the sun, rain &c. Bhāvamiśra³ also describes its efficacy similarly. Umbrella is one of the insignia of royalty in India, and is always held over the heads of kings as shown in the Sanchi and Amarāvati sculptures⁴. It is still commonly used in India.

YAŚTI OR STICKS.

Caraka⁵ directs us to use a stick as a support. Suśruta says: "By using sticks, a man gains in strength, prowess and manliness. He becomes courageous, patient and forbearing. He can stand erect and is not troubled by any fear"⁶. It

¹ वर्धनिलरजोघर्षं हिमादीनां निवारणं ।

वयस्य चक्षुष्य मीजस्यं गृह्यते कवधारणं ॥

Suśruta Saṁhitā, IV. xxiv.

² ईतिर्विधमनं वयस्यं गुणान्तरणमृद्धरम् ।

वर्धनिलरजोऽप्युच्चं कवधारणसमुत्तमम् ॥

Caraka Saṁhitā, I. v.

³ कवच धारणं वर्धनपत्रात् रजोऽप्युत्तमम् ।

हिमघ्नं हितमन्नाद्य माद्वन्द्यमपि कीर्तितम् ॥

Bhāva Prakāśa, I. i.

⁴ See Indo-Aryans, I, p. 266.

⁵ खलतः संप्रतिष्ठानं शतृषाद्य निदूदनं ।

अवहृत्तनमायुष्यं भयघ्नं दण्डधारणम् ॥

Caraka Saṁhitā, I. v.

⁶ दृढः सुरीक्षपद्माल विधाचिभ्योभयापहं ।

शमखलन दोषघ्नं स्वविरिच प्रशस्तम् ॥

सस्त्रीक्षाद्वललौघ्यं धैर्यवीर्यं विवर्धनम् ।

अवहृत्तनमायुष्यं भयघ्नं दण्डधारणम् ॥

Suśruta Saṁhitā, IV. xxiv.

protects a man from dogs, snakes &c. Bhāvamīśra¹ apparently quotes these verses from Suśruta.

UPĀNAHA OR SHOES.

The ancient Hindus used two kinds of shoes, made of wood and leather. The wooden pādukā is recommended to be used before and after dinner². The good effects claimed by its use are, an increase of the power of vision, strength and longevity.³ When travelling, the upānaha or leather shoes are to be used. Besides the advantages mentioned above, shoes are very comfortable to the travellers and prevent many diseases of the feet⁴. If any one often travels barefooted, he feels out of sort, his senses fail, vision becomes impaired and his expectation of life is reduced.⁵

¹ Bhāva Prakāśa, I. i.

² पादुकारोहणदुष्यान् पूर्व भोजनतः परम् ।
पादरोग हर इत्थं चक्षुष्यश्चाक्षुषो हितम् ॥

Bhāva Prakāśa, I. i.

³ चक्षुष्यं स्पर्शनहितं पादयोग्यमनापहम् ।
वक्ष्यं पराक्रममुख्यं इत्थं पादवधारणम् ॥

Caraka Saṁhitā, I. v.

⁴ पादरोगहरं इत्थं रक्षोन्नं प्रीतिवर्धनं ।
सुखप्रचारमोजस्यं सदापादवधारणं ।
अनारोग्यं मनायुष्यं चक्षुषीरुपपातकम् ।
पादाभ्यामनुपानङ्गां सदा चक्रमणं नृणां ॥

Suśruta Saṁhitā, IV. xxiv.

⁵ उपानहधारणं नेत्रामायुष्यं पादरोगहृत् ।
सुखप्रचारमोजस्यं इत्थं परिकीर्तितम् ॥
पादाभ्यामनुपानङ्गां सदा चक्रमणं नृणाम् ।
अनारोग्यं मनायुष्यमिन्द्रियघ्नं नष्टिदम् ॥

Bhāva Prakāśa, I. i.

The Hindus wore sandals like the ancient Greeks. They also used boots, which look like the modern boots used by Europeans. Buddha gave the Bhikkhus permission to wear boots or shoes, with thick lining¹. Hiuen Tsiang² says that "here (Avanti) Tathagatha gave permission to the Bhikkhus to wear kih-fu-to (boots)." For an account and figures of ancient boots used by the Hindus, see Indo-Aryans.³

VIJĀJANĪ AND CĀMARA. THE FAN.

The fan was used for airing the patients to drive away flies.⁴ Suśruta mentions the cāmara *i.e.*, the tail of the Thibetan yolk (*Bos grunnius*) to be used as a fan. "It soothes the inflammation of boils and also acts as a fly-brush to prevent infection of the open wound"⁵. The cāmara is also one of the insignia of royalty and as such we have many representations of it in the sculptures of ancient India⁶. For diagrams of the ancient fan, see Indo-Aryans⁷.

Caraka directs us to use a kulā or fan to winnow corn, prepared from the kāśa (*Saccharum Spontamum*) to resuscitate a still-born child⁸.

¹ Mohārāga, varga 13 ff 6. S. B. E. vol. xvii, p. 35.

² Beal's Records of Buddhist Religion, vol. II. p. 280.

³ Indo-Aryans, Vol. I, p. 123-8.

⁴ बालव्यजनं भोजनं मयिकादीनपोहति ।

शोधदाह यमस्वेद मूच्छात्रो व्यजनानिहः ॥

Suśruta Saṁhitā, IV. xxiv.

⁵ व्यजेत बालव्यजनैर्ब्रह्मं न च विषट्सेत् ।

Ibid, I. xix.

⁶ See Indo-Aryans, vol. II, p. 267-70.

⁷ For diagrams, see Indo-Aryans, vol. I, p. 263.

⁸ तथा संक्षेपविहितान् प्राणान् पुनर्लभेत लघुकपालिकायुक्तेषु चैनमभिः लिखनीयाद्-
यथेष्टं क्षान् वाचन् प्राणानां प्रथममनं तत्तत्सर्वमैवकुर्वः ॥

Caraka Saṁhitā, IV. viii.

Bhāvamīśra¹ mentions fans made of the following materials:—palm leaf, bamboo, yolk's tail, cloth, peacock's feather and cane. He attributes peculiar properties to each fan.

Rājavallabha says² that "the palm-leaf fan overcomes disturbances of all the three humours, and is light and agreeable; the bamboo fan causes heat and irritability, and promotes inordinate secretion of the two humours—air and bile; the cane, cloth and peacock's feather fans, overcome disturbances of the three humours; the hair fan is invigorating etc."

The Buddhist Bhikkus used the palm-leaf fan. "Not unfrequently there is added a lotus-leaf shaped fan, made from a single frond, with an edging of bamboo or light wood, and furnished with a handle fashioned like the letter "S". The palm from which the leaf is taken, is also that used for the mss., namely the Talipot; hence the name Talponi given to the Bhikkhus by the early Portuguese adventurers in Burma. When he attended a meeting at which women are likely to be present, every Bhikkhu must have the fan."³

* व्यजनस्नानिषो दाह स्वेदमूर्च्छा घनापहः ।
तालङ्गनमरो वातनिदोषशमको मतः ॥
वंशव्यजनजम्बू रक्तपित्तकोपकः ।
चामरो वस्त्रमधूतो मादूरी वैवजलाघा ॥
एते दोषजिता वाताः शिखा हृद्याः सपूजिताः ।

Bhāva Prakāśa, I. i.

* तालव्यजनगुणः—विदोषशमनत्वम् । लघुत्वञ्च ॥ वंशव्यजनगुणः—रूचत्वम् ।
लघुत्वम् । वायुपित्तकारित्वञ्च ॥ वैवज्रमधूरपुष्पव्यजनगुणः—विदोषनाशित्वम् ।
वाजव्यजनगुणः—तेजस्करोत्वम् । मलिकादि निवारकत्वञ्च ।

Rājavallabha.

³ The Way of Buddha, p. 53-54.

FILTERS.

Filters were used by the Hindus and are recommended to be made of an earthen or metallic vessel, the mouth being closed by a piece of cloth tied round its neck.

If the water be filthy, Suśruta¹ advises us to purify it by boiling it or by exposure to the sun; or by throwing hot iron balls, sand or clay balls into the water and then allowing it to cool. Such purified water should be scented with the flowers of Nāgakeśara (*Mesua Ferrea*), Campaka (*Michelia Champaca*), Utpala (*Nymphaea Stellata*) and Pataka (*Bignonia Snavicolens*).

Suśruta mentions seven means of purifying polluted water², viz.,

1. Katakaphala or nirmālaya or seeds of *Strychnos Potatorum*.
2. Gomedaka or a kind of gems.
3. Viṣagranthi, or root of *Nelumbium Speciosum*.
4. Śaivālamūla or root of *Vallisneria Spiralis*.
5. A piece of cloth.
6. Pearls.
7. Precious Stones and crystals.

¹ व्यापन्नानामधिक्येन सूर्यातपप्रतापेन तदावःपिण्डसिकताकीडाणां वा निर्वापेन प्रसादनञ्च कर्त्तव्यं नामवम्पकोत्पलपाटलापुष्पप्रभृतिभिर्वाधवासनमिति ।

Suśruta Samhitā, I. xlv.

² तत्र सप्तकलुषस्य प्रसाधनानि भवन्ति । तद्यथा । कतकगोमेदकविषयशिशेवालमूल-
वस्त्राणि मुक्तामणिचेति । पद्मनिक्षेपणानिभवन्ति । तद्यथा । फलार्कं वाटकं मुञ्चवल्लय
उदकमक्षिकाशिकञ्चेति । सप्तमीतिकरणानि भवन्ति । इवातस्त्रापनमुदकप्रक्षेपणं घटिका-
शामशं व्यजनं वस्त्रोद्धरणं बालुका प्रक्षेपणं शिखावलम्बनञ्चेति ।

Ibid.

He mentions five kinds of means for preventing contact of the water vessel with the earth¹ :—

1. Phalaka or planks as of Śālmali wood.
2. Tryastaka or octogonal tripod of wood.
3. Muñjvalaya or circular pad of Saccharine Muñja.
4. Udakamañcikā or a raised framework of cane and bamboo.
5. Śikya or a loop suspended by three strings.

He mentions seven ways of cooling water :—

1. Exposure to air.
2. Sprinkling water on the vessel.
3. Stirring the water with a rod.
4. Fanning the water.
5. Filtration through cotton fabrics.
6. Putting the vessel of water on a sand bed.
7. Suspension of the vessel in a loop.

He advises us to use rain water filtered through a broad piece of white and clean cloth². In collecting water from the rivers and ponds, the Hindu females still use a kalasī or earthen vessel, the mouth being closed by a piece of cloth.

¹ In the English translations of the *Saṁhita*, *Bibliotheca Indica*, Dr. Cattopādhyāya translates the passage incorrectly. He misunderstood the terms phalaka, &c. to be remedial agents, necessary in the purification of water.

² नाहं पुनः प्रधानं तदुपाददीताद्युक्ते नास्ति अविश्रब्धित तपटेकदेशच्युतस्य वा हन्यातलपरिषदमनैर्वा अविभिर्मात्रैर्ह्येते ।

Suśruta¹ deprecates impure water as injurious to the human system and advises us not to drink or bathe in such water as there is always the risk of being speedily affected with many diseases.

"It (filter) forms one of the eight sacred utensils necessary for a sramana of the Buddhist order. It is a strainer or water-dipper—an apparatus for filtering the water which he drinks, so that he may not, even unwillingly, take animal life"²

One of the six requisites of a Bhikṣu is *Paṇṣāvana*, a water-strainer³.

WATER VESSEL.

To store water, Suśruta mentions vessels of gold, or silver, or earth⁴.

"The clean water is kept separately from water for cleansing purposes (*lit.* 'touched' water), and there are two kinds of jars (*i.e.* *kundi* and *kalasa*) for each. Earthenware or porcelain is used for the clean jar, and the jar, for water for cleansing purposes (*lit.* 'touched water') is made of copper or iron. The clean water is ready for drinking at any time, and the 'touched' water for cleansing purposes after having been to the urinal.

¹ व्यापन्नं वर्जयेद्विषं तीक्ष्णं दद्याच्छलातैर्ब ।

दोषसञ्जनं ह्येतन्नाददीताहितानु सन् ॥

व्यापन्नं सखिलं यस्तु पिवतीहा प्रसाधितं ।

इयद्यु' पाण्डुरोगश्च लब्धोऽसविपाकतां ॥

आसकासप्रतिशयापयुक्तगुल्मोदरानि च ।

अनान् वा विषमान् रोगान् प्राप्नुयात् क्षिप्रमेव च ॥

Suśruta Saṁhitā, I. xlv.

² The way of Buddha, p. 58.

³ I'Tsing, ch. x.

⁴ सौदर्यं राजते मृन्दये वा पाये निदध्यात् तच्छालकालमुपयुञ्जीत तन्नालानि भौमम् ।

Ibid.

The clean jar must be carried in a clean hand, and be placed in a clean place, while the jar for the 'touched' water should be grasped by the 'touched' (or 'unclean') hand and be put in an unclean (or 'touched') place. The water in a pure and fresh jar can be drunk at anytime; the water in any other jar is called 'special water' (more *lit.* seasonable water *i.e.* water to be used at certain prescribed times, probably *kālodaka*)."¹

BATHING.

The Hindus in their daily life do not eat without having first washed themselves in a bath. They always use a bathing-sheet and this ancient practice is still followed.

Bhāvamiśra says² : "Bathing stimulates the appetite, virile power and strength, prolongs life, allays thirst and burning sensation, cures eczema, and washes out dirt and perspiration."

Besides the ordinary bath, there is some evidence of the use of a medical bath to cure diseases. I'Tsing says³ : "The World-honoured One taught how to build a bath room, to construct a brick pond in an open place, and to make a medical bath in order to cure a disease. Sometimes he ordained the

¹ I'Tsing, ch. vi.

² दीपनं शयनायुष्यं स्नानं मोक्षो बलप्रदः ।
 कण्डूमलघ्नः स्निग्धतन्द्रा लङ्घनाह पापघ्नः ॥
 बाह्यैश्च शैवेः शीतार्थं कृष्णान्नशक्तिं पीडितः ।
 गरस्य स्नातमावस्य दीप्यते तेन पावकः ॥
 शीतेन पयसा स्नाते रक्तपित्तप्रशान्तिरुक्तः ।
 तदेवौष्णेन तोयेन वज्रं वातकफापहम् ॥
 शिरः स्नानमवच्छेद्य मनुष्येनाम्बुना सदा ।
 वातश्लेष्म प्रकोपे तु हितं न च प्रकीर्तितम् ॥

Bhāva Prakāśa, I. i.

³ I'Tsing, ch. xx.

whole body to be anointed with oil, sometimes the feet to be rubbed with oil every night, or the head every morning; for such a practice is very good for maintaining clear eyesight and keeping off the cold." "Bathing should always take place when one is hungry. Two kinds of benefits are derived by having meals after bathing. First, the body is pure and empty, being free from all dirt, second, the food will be well digested, as the bathing makes one free from phlegm or any disease of the internal organs. Bathing after a good meal is forbidden in the 'Science of Medicine' " (Kikitsā-Vidyā).

DRINKING VESSEL.

Scented water is advised to be drunk out of cups made of gold, or silver, or copper, or bell-metal, or lapis lazuli or earth.¹ Bhāvamiśra² also mentions cups of the same materials.

"To drink from a jar holding it upright in front is no fault; but drinking in the afternoon is not permissible. A jar must be made to fit one's mouth; the top of the cover should be two fingers high; in it a hole as small as a copper chopstick is made.

Fresh water for drinking must be kept in such a jar. At the side of the jar there is another round hole as large as a small coin, two fingers higher than the drinking-mouth. This hole is used for pouring in water; two or three gallons may be put in it. A small jar is never used.

¹ See foot-note 2, P. 65.

² कलपावन्तु तासस्य तदभावे सदोहितम् ।
पवित्रं जीतलं पाचं मृदितं मृष्टिकेन यत् ॥
काचैश्च रचितान्नद्यतया वेदुष्यं सम्यगम् ।

If one fear that insects or dust may enter in, both the mouth and the hole may be covered by means of bamboo, wood, linen, or leaves. There are some Indian priests who make jars according to this style. In taking water the inside of the jar must be first washed in order to get off any dirt or dust, and then fresh water must be poured in.

A priest who travels, carries his jars, bowl, necessary clothes, by hanging them from shoulders over his cloak, taking an umbrella in his hand. This is the manner of the Buddhist priests in travelling¹.

DINNER SERVICE.

Suśruta² advises us to use different kinds of vessels for distributing the various kinds of food :—

Iron vessels for ghee or clarified butter.

Silver vessels for drinks, soups and gruels.

¹ PTsing, ch. vi.

² वृतं कार्पायसे देवं पेया दद्यात् राजते ॥
 कलानि सज्जन्त्यां प्रदद्यादलेषु च ।
 परियत्कप्रदिग्धानि सौवर्णेषु प्रकल्पयेत् ॥
 प्रदद्यात् रसाद्यैव राजतेषूपहारयेत् ।
 कटुराणि खडांश्चैव सर्वान् शैलेषु दापयेत् ॥
 दद्यात्तामसये पात्रे सुशीते सुगते पयः ।
 पानोद्यं पानकं मद्यं सस्त्रयेषु प्रदापयेत् ॥
 काचकटिकपात्रेषु शीतलेषु शमेषु च ।
 दद्याद्दूर्ध्वपात्रेषु रामबाडवसृक्कान् ॥
 पुरजाहिमले पात्रे सुविस्तीर्णे मनोरमे ।
 मृदः सुपीदने दद्यात् प्रदिग्दांश्च सुसंस्कृतान् ॥

Plantain leaf vessels for fruits and sweetmeats.

Gold vessels for flesh.

Stone vessels for whey.

Copper vessels for milk.

Earthen vessels for water, sherbets and wines.

Glass, crystal, lapis lazuli vessels for rājāsāḍava and saṭṭaka.

In the *Bhāva Prakāśa*¹ we have a detailed description on the subject—"A dinner service of gold is the best from a medicinal point of view, and it is supposed to be the best tonic for the eye. Eating out of silver is equally efficacious for promoting hepatic functions. A service of zinc improves the intelligence and appetite. Food served in brass utensils promotes wind and heat, but cures phlegmatic disorders and expells worms. The use of steel or glass vessel cures chlorosis, jaundice and intumescence. A stone or clay service brings on poverty. Wooden plates are good appetisers, but help the secretions of phlegmatic humour. The use of certain leaves as plates acts as an antidote against poisons. When at dinner, a water jug with a cup should be placed on the right hand. A copper vessel is the best for the purpose. The next best is an earthen pot. Vessels made of crystal and lapis lazuli are also pure and cooling".²

¹ चायमे काचपात्रे च भोजनं सिद्धिकारकम् ।

शोथं पाण्डुरं च कण्ठं कामलापहसुखमम् ।

ज्वरं च मूत्रं पात्रे भोजनं यौनिवारणम् ।

दारुणं विशिष्टं रुचिर्दंष्ट्रं भकारितुम् ।

पात्रं पत्रमयं रुच्यं दीपनं विषपापनुत् ॥

Bhava Prakāśa, I. i.

² *History of Aryan Medical Science*, p. 64-5.

SPOONS.

I'Tsing says¹ : "As to the mode of eating in the West, they use only the right hand, but if one has had an illness or has some other reason, one is permitted to keep a spoon for use."

SPITTOONS.

Spittoons were commonly used by the ancient Hindus, and Caraka² mentions it as one of the things necessary for the sick room. It is also mentioned in the Mohāvagga³: "And the sethe's wife spat it out into the spittoon." Fa-Hian⁴ noticed a "stone spitting vessel in this country (Kie-sha) belonging to Buddha."

BEDPANS AND URINALS.

The bedpan and urinal were also used by the patients in ancient times. Caraka mentions them to be necessary in a sick room.⁵

PUS BASINS.

Metallic basins marked with different measures were used for holding discharges after operations. In the Aśvavaidyaka⁶

¹ I'Tsing. ch. xvi.

² चोदन्त्यस्तमाङ्गारं प्रतिगृह्णाति ।

* * * *

प्रतिगृह्णातीदं पच्यते ॥

Caraka Saṁhitā, I. xv.

³ Sacred Books of the East. VIII: i. 11.

⁴ Beal's Records, vol. I. Introduction, xxviii.

⁵ See Page 36 and foot-note 1, P. 34.

⁶ प्रदेशे क्षोमशे निव्यं क्षोमान्मुतपाय वेधयेत् ।

प्रमाणाद्यैश्च पानेन रक्तं मृज्जति बुद्धिमान् ॥

Aśvavaidyaka, XV. verso 30.

blood let out in the operation of phlebotomy, is recommended to be collected in a basin, so that the quantity may at once be determined.

PESTLE AND MORTAR.

Pestle and mortar are mentioned in the *R̥gveda* for preparing the Soma juice.¹ And their use in pharmacy was well-known to the ancients.

Besides the pestle and mortar of pharmacy, we find mention of a large wooden pestle used in reducing dislocation by *Suśruta*.² *Caraka* says that two pestles and motars should be kept in a lying-in-room, the object being to allow the woman some kind of work; and then she will not lie down idly on her bed if there be any delay in the delivery of the child³. *Suśruta* also recommends it⁴. "The mortar (*ulukhala*) and pestle (*muṣala*) are to be made of very hard wood, *viz.*, both of *Varana* wood (*Crataiga Roxburghii*), or the mortar of *Palāśa* wood (*Butea Frondosa*), and the pestle of *Khadira* wood (*Acacia Catechu*). The former

¹ उलूखलमुतानामवेदिष्ठं जम्बूलः ॥

* * *

यचिदि त्वं गृहे गृहे उलूखलकं दृश्यसे ।

R̥gveda, I M. 28 S. 1 A. 2 R.

² See foot-note 6, P. 172.

³ See P. 39, and foot-note 1, P. 40.

सा चेदावीभिः संक्षिप्तमाना न प्रजायेतायेनां ब्रूयात् उत्तिष्ठमूषलमन्वतरञ्च गृहीष्वानेतेतद्-
दूखलं धान्यपूणे महर्भ्यं हरिषिदि महर्भ्यं हरिषञ्चस्र चक्रमस्र चानरानरा इत्येवमुपदिशन्त्येके ।

Caraka Saṁhitā, IV. viii.

* काजातीतस्यादिनि यमं विज्ञेयतः सधान्यमुदूखलंमूषलेनाभिहन्वादिपद्मे वा यात्रामने
सेवेत ।

Suśruta Saṁhitā, III. x.

is to be of the height of the knee and the latter three aratnis (cubits) long¹."

On the inner face of the left pillar in the eastern gate of Sanchi Tope, there is a beautiful representation of a kitchen scene, in which the ancient mortar and pestle are shown. "The mortar and two-handed pestle same as those in use at the present day in India. The mortar (okhli) is exactly the same as the Greek *γῆη*, and the Roman *pila*; and the pestle (*musar*) is the same as the Greek *Κόρυμβος*, and the Roman *pilum*"²

The pestle and mortar used in pharmacy was called *aśmabhālam*. It is still used to pulverise medicaments, and is made of iron or brass.

In the *Mahāvagga*³ we find a reference to the pestle and mortar. "I allow, O Bhikkhus, the use of a *chunam* as a medicine by whomsoever has the itch, or boils, or a discharge or scabs, or whose body is ill smelling, and to those in health the use of dry dung, and of clay, and of coloring matter. I allow, the use, O Bhikkhus, of a pestle and mortar" (*udukhalam nusalāñ ka*).

SIEVES, STRAINERS AND FILTERS.

There is evidence that cloth seive was used by the Hindus in ancient days, we find it mentioned in the *R̥gveda*⁴. The purpose of straining and filtering solid and liquid medicines respectively is mentioned to have been served by two or

¹ Schol. on *Kat̥y.* 1.3.3.6, footnote, *Śatapatha Brāhmaṇa* (Sacred Books of the East, 1.1.4.8.)

² Cunningham's *Bhilai Topes*, p. 207.

³ *Mahāvagga* VI. 9. 2.

⁴ *R̥gveda*, 10m. 71s. V 2

three layers of a piece of cloth. And we know that in the prehistoric Soma rites, it "was pressed, passed through a seive, mixed with milk, and offered as the main oblation",

The reference to a cloth sieve, we find in *Mohāvagga*¹ : "Now at that time the Bhikkhus who were sick had need of sifted chunam as medicine.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a chunam sieve".

They had need of the chunam very fine.

"I allow, O Bhikkhus, the use of a cloth sieve".

Pavitra was used in the Vedic times². It was a filter. Wilson translates it : "Trough the purifying filters".

COLD AND HOT APPLICATIONS.

To relieve colic pains, vessels made of silver, copper or precious stones, containing cold water, are directed to be placed upon the part or better upon the navel³. Besides these, leather vessels containing cold water are also directed to be used for reducing the temperature in *dilirium tremens*.⁴

¹ *Mohāvagga* VI. 10. 1.

² मध्वः पुनानाः कविभिः पवित्रैर्दुग्धमिहिवन्त्यङ्गुभिर्धनुनीः ॥

Rgveda, 3m. 31 s. 18 Rk.

अङ्गुं दृष्ट्वा हिमनि भरितेर्मध्वः पुनलि धारया पवित्रैः ॥

Ibid, 3m. 36 s. 7 Rk.

³ मणिराजत ताम्रानि भाजनानि च मज्जंशः ।

वरिपूर्णानि तान्वास्त्र यन्त्रस्योपरि निक्षिपेत् ॥

Saṅgraha Saṁhitā, VI. xlii.

⁴ हिमराजत कांस्यानां पात्राणां शीतवारिभिः ।

पृथ्वीनां हिमपूर्णानां दृप्तानां पवनारुताः ॥

Caraka Saṁhitā, VI. xii.

Heat is directed to be applied to the patient's body in various ways¹ :—

I. *Tāpasveda* :—palm of the hand, brass dish, sand, cloth, potsherd &c. are the means mentioned for applying heat to the body.

II. *Uṣṇasveda* :—potsherds, stone, bricks, or iron balls are to be heated to redness and then water is to be sprinkled upon them. The part to be fomented is covered by a wet piece of thick lint and then the heated materials are to be applied over it. Or heat may be applied by means of a narrow vessel containing hot decoctions. The vessel is to be surrounded by a piece of

१ चतुर्विधः स्वेदनादयथा । तापस्वेद उष्णस्वेद उपनाहस्वेदोद्वस्वेद इति ।
अथ सज्यस्वेद विक्लवाशरीषः ॥

तत्र ताप-स्वेदः । पाणि कांसकन्दकपाल वानुकावस्त्रेः प्रयुज्यते शयानस्यवाहतापो बहुशः
श्वादिवाह्यैरिति । उष्ण-स्वेदस्तु कपाल पाषाणैःकालोह-पिण्डान्निर्वर्णान्नि र्नामिस्वेदस्तु
द्रव्यैर्वर्तते राट्णलकक परिवेष्टितमङ्ग-प्रदेशं स्वेदयेत् । मांस रस पयोदधि धान्याम्बवातहर
पत्रमङ्ग काष्ठ पूर्णा वा कुक्षीमनुततां प्राङ्मोक्षार्णं मृज्जीवात् । पार्श्वं क्षिद्रेण वा कुक्षेनाधी-
मुखेन तस्य मुखमभिमन्वाय तथिन् क्षिद्रे हन्ति यन्त्राकारां नाडीं प्रणिधाय तम् स्वेदयेत् ।

मुखोपविष्टं स्वभङ्गं गुरु प्रावरणाहृतं ।

हन्तिशूलिकया नाद्या स्वेदयेद्वात-रोगिणं ॥

मुखा सर्वाङ्गना ह्नाया नच क्षिप्राति सानवं ।

व्यामाहंमात्रा विर्वका हन्ति हस्त समाकृतिः ॥

स्वेदनाद्यै हिता नाडी कैलिङ्गी हस्ती शूलिका ।

* * * * *

उपनाह स्वेदस्तु वातहरमुलकस्त्रेरस्य पिष्टैर्लेपन प्रगाढैः मुखोन्धेः मुखोन्धेः प्रदिक्ष
स्वेदयेत् । एवं काकोल्यादिभिः मुरसादिभिसिलातमौ मर्षप कल्कैः कृशरा पत्यसोत्कात्रिका-
भिर्वैसवारैः शालकैश्चातनुवस्तावनडैः स्वेदयेत् ।

द्रव स्वेदस्तु-वातहर द्रव्यकाय पूर्णं कोष्ण कटाक्षं द्रोण्यां वावगाह्य स्वेदयेत् । एवं पयोमांस-
रस-पुष्प-तेल-धान्याम्ब-घृत-वसा मूत्रैश्चवगाह्यत मुखोन्धैः कषाद्यैः परिधिषेदिति ।

cloth to prevent the skin from being burnt. Or heat may be applied by the following device:—an earthen vessel or kalasi containing hot decoctions is to be closed; and the vessel is then to be inverted. Then a hole should be bored on its side, and a tube shaped like an elephant's proboscis is fitted to it; the vapour issuing from the tube is allowed to play on the part.

To apply vapour bath:—put the hot infusion of medicinal substances into an earthen vessel and close its mouth. Drill a hole into the side of the vessel and adapt a tube to it. The tube may be either metallic or wooden. The tube should be two hands (forearm and hand) long and made of three pieces; the end of the tube which should taper like a cow's tail must be six *aṅguli* long. The patient should be seated on a stool and well covered with cloth. The tube is then introduced inside the blanket, and thus the issuing vapours heat the whole body. (*Śārṅgadharma*¹).

Suśruta says that the tube should be half *byām* (*i.e.*, the distance between the two hands when extended) long, bent thrice and shaped like an elephant's proboscis. Sometimes a large stone slab is to be heated with burning wood of *Aecia Catechu*. Then after removing the ashes, the patient is directed to lie upon it. A tent or cloth-cover having four doors is sometimes required for the patient to sit in, and heat is applied by burning wood outside it.

¹ अथवा वातनिर्वाशिद्रव्यकादरसादिभिः ।

उत्तमैर्घटं पूरयित्वा पात्रे हिटं विधाय च ॥

विमुद्रासं निखण्ड्य चतुर्जां कातजां तथा ।

षडङ्गुलास्यां गोपुच्छां नाडीं मुञ्चान् दिहलिकां ॥

मुखोपविष्टं स्नान्नात् गुरुमावरणावृतम् ॥

इक्षौद्यन्त्रिकया नाद्या भवेद्वेद्वेदातरोनिष्णम् ॥

Śārṅgadharma Saṁgraha, III. ii.

III. *Upānahasveda* or poultices :—roots of medicinal plants are to be pressed and formed into a paste with mustard, sesame etc. This is to be beaten, put on a thin cloth and so applied.

IV. *Dravasveda* or hot bath :—the patient is to sit in a tub or vessel of hot water. Iron pails or tubs are recommended to be used by patients to take bath in some infusions. *Śārṅgadharma* says¹: The tub (*droṇi*) should be made of gold, or silver, or copper, or iron, or wood. The height and length of the tub should measure thirty-six *aṅguli* each. When the patient sits inside, the height of water should stand six *aṅguli* above the navel. A *droṇi* filled with oil is to be used for placing an unconscious patient in it to overcome the shock caused by fall, blows, fractures and other injuries.

*Cakradatta*² describes the four methods of applying heat, *Bhāvamiśra* also describes them similarly³. *Hārīta*, however, mentions seven methods of heat-application⁴.

- ¹ मोघर्षे राक्तं वापि ताम्बादसञ्च दाहकम् ।
कोष्ठकं तत्र कुर्वीतोच्छायि षट्त्रिंशदङ्गुलम् ॥
आयामिन तदेवस्थावतुष्कं मरुणं तथा ।
नाभिः बद्धुलं यावन्मग्नः कायस्य धारया ॥

Śārṅgadharma Saṁgraha, III. ii.

- ² तप्रेः सैकतपाणिकांश्चमनेः स्वेदोऽथवाद्धारक-
र्त्तपादातर्हः सहास्रलवणसेचैः सुखीषैर्मयेत् ।
एवं तप्तपयोऽम्बुवातश्मनकाषादिमेकादिभि-
न्नाग्नेस्तोयनिषेचनोद्भवहृदाप्यैः शिलाद्यैः क्रमात् ॥

Cakradatta, Svedādhikāra.

- ³ स्वेदश्चतुर्विधः प्रोक्तस्तपोश्चस्वेदसंज्ञितः ।
उपनाही ढवः स्वेदः सख्ये वातान्तिहारिणः ।
तापस्वेद उष्णस्वेदश्च ताभ्यां संज्ञितः ।

Bhava Prokṣa, I. i.

- ⁴ स्वेदः सप्तविधः प्रोक्तो लोहस्वेदो वायस्वेदोऽग्निज्वालास्वेदः ।
षट्स्वेदो जलस्वेदो फलस्वेदो बालुकास्वेदश्च ।

Hārītā Saṁhitā, V. (v).

BALANCE OR MĀNADAṆḌA.

For weighing medicinal substances, the scales and balance are often mentioned. They mention a set of weights and measures to be used in weighing substances. Alberuni¹ describes the Hindu balance thus :—"The balance with which the Hindus weigh things, are *χαλιδ ριμςτε* of which the weights are immovable, whilst the scales move on certain marks and lines. Therefore the balance is called *tūla*. The first lines mark the unit of the weight from 1 to 5, and further on to 10; the following lines mean the tenths, 10, 20, 30, &c. In Fergusson's 'Tree and Serpent Worship' we have a diagram of steel-yard, where a man is represented as stepping in the scale, apparently to weigh himself². The ordinary balance is still in common use amongst the *kavirājes* of the present day.

COLLYRIUM POTS.

The Hindus used to apply collyrium to their eyes, from a very early time. It is said to stimulate the growth of eye-lashes, brighten the lustre of the eye-balls and clean the pupil³.

Bhāvamiśra⁴ recommends us to use collyrium as it improves the visual power and cures many diseases of the eye. It is

¹ Alberuni's India. Trans. by Sachau, vol. 1, p. 146.

² The Tree and Serpent Worship, the pl. lxxxiii, fig. 1.

³ पञ्चलं विशदं कान्तममलौष्कलं मण्डलं ॥

नेत्रमञ्जनं संयोगादभवेद्भ्रामलं तारकं ।

Suśrūtā Saṁhitā, IV, xxiv.

⁴ श्रीवीरभञ्जनं निव्यं हितमकाशतो भजेत् ।

शोचने भवतसेन मनोऽपि मृच्छदर्शने ॥

“श्रीवीर” चेत् सुरमा इति शोके प्रसिद्धम् ।

शोचतीहृन्नं मतं चेत्तं विषदं मिथुमन्त्रम् ॥

contra-indicated in patients suffering from fever, emesis, exhaustion, &c.

Suśruta mentions collyrium pots of different metals intended for different kinds of collyrium then in use—

gold	pots	for	sweet	collyrium.
silver	pots	for	acid	collyrium.
horn	pots	for	salt	collyrium.
copper & iron	pots	for	astringent	collyrium.
lapis lazuli	pots	for	sour or acid	collyrium.
bell-metal	pots	for	bitter	collyrium.

He also mentions pots of ivory, or crystal, or coral, or horn, or conch-shell, or stone, or gold, or silver¹.

He also mentions a piece of bamboo for storing collyrium². A bamboo is still used by the poor for keeping oil in India. For a similar purpose the wood of Khadira (*Accacia Catechu*) is also

इष्टेः कण्डूलहरं दाहकं च ज्ञापयन् ।

अलंकारादृष्टे च सङ्निभारतातपी ॥

नेत्रे रोमा न जायन्ते तथा दञ्जनमाचरेत् ।

“शोतोद्वेगं” कृष्णसुरमा इति लोके प्रसिद्धं ॥ “विशुद्धं” गोधनं विनापि ।

“सिन्धुसन्धवम्” सिन्धुनाम पर्वतस्य च सन्धवम् ।

रात्रौ जागरितः शालः कर्दितो मुक्तवांसदा ।

ज्वरातुरः शिरस्तातो नाकीरञ्जनमाचरेत् ।

Bhāva Prakāśa, I. i.

¹ See foot-note 3, P. 67.

² कज्जकामोकशालास्यपियङ्गुमलिनोत्पलैः ॥

पुष्पैर्वेणुक्याञ्चापण्यामलक संयुतैः ।

सर्पिर्मधुवृक्षैश्चैतद्वनारामवस्थितैः ॥

recommended¹. For storing oil, Dr̥ḥavala² mentions the use of vessels of stone or the horn of a lamb or iron.

MEDICINE GLASS.

Sukti or shell of mussell was used as medicine glass. The shell of the fresh water mussels unionacea is mentioned to be used for holding a dose of medicine for administering it to a patient³. They generally have equivalve, though not equisided, shells which are covered externally with a smooth brown epidermis and internally by a mother-of-pearl layer. Such a shell "is said to have been formerly much used in England by painters for holding their colour and so the commonest variety is termed unio pictorua. To apply oleaginous errhines, Saśruta⁴ recommends us to use metallic pots or the shell of mussel. It is still used in India for feeding the babies with milk and also for administering medicines to the patient. Heyne⁵ (1814) says that "according to the nature of the disorder, the medicines should be taken out of gold, silver or brass vessels. But if these should not be at hand you may use iron or even earthen vessel."

१. सेत्सवोपहितं युद्धाद्रिहितं वेणुनदरे ।
 मेदीयकद्वयतद्वान् पिशुन्यः सेत्सवं मधु ॥
 रसमामलकचापि पक्वं मधुञ्जिधापयेत् ।
 कोशि खदिरनिम्बानि तदन्तु खट्वाङ्गनं हितं ॥

Saśruta Saṁhitā, VI. xvii.

¹ See foot note, 4, P. 67.

² तत उपमंक्तुशरीरं प्रातः प्रातस्त्याय पाणिग्रहिमात्रं सौद्रेण प्रतिमंस्तुवोपयुज्यते ।

Saśruta Saṁhitā, IV. x.

³ वामहस्तं प्रदेशिन्व सौम्रमितनालायाश्च विशुद्धं कोतसि दक्षिण हस्तेन खेदमुत्थानं तत्र रजतं सुवर्णं ताम्रं चत्पाव यत्किनामन्यतमं च युक्ता पिशुना वा मुखोष्णं खेदमद्रुतमासिकेदं व्यवच्छिन्न-धारं यवानिनेन प्राप्नोति ।

⁴ Dr. Heyne's Indian Tracts,

Ibid. IV. xi.

DROPPER.

The Hindus used a tent of cotton as a drop-conductor. Cakradatta¹ advises us to drop medicines into the eyes thus:—the patient should be made to lie down in a place free from draught; the surgeon is to open his eye with the left hand, while with the right, he allows 10 or 12 drops of medicine to fall from a height of two *añguli* on the eye from a tent of cotton, immersed in medicine contained in a clean vessel.

GRIND-STONE.

Grind-stone to pulverise medicaments is mentioned. In the *Mahāvagga*² we find a reference to it. ‘I allow, O Bhikkhus, the use of a grind stone, and of another stone to grind upon’ (*pisana-sīlā ka pisana pota ka*—*Buddhaghosha*).

STONE AND IRON MULLER.

For similar purpose a stone slab and iron muller are necessary to make pastes and powders of medicines. On the inner face of the left pillar in the eastern gate of Sanchi Topes, the kitchen scene is represented, in which ‘a fourth woman is seated grind-ing spices or condiments on the sil, or flat stone, with a bant or round muller³’.

KHAL OR ELLIPTICAL MORTAR OF STONE AND PESTLE.

To prepare medicines to be exhibited to the patients, a small

¹ निवातस्यस्य धमिन दासिनीस्यीत्य लोचनम् ।

यस्त्रीमलमयान्तेन पिबुवर्त्ता कर्त्तव्यम् ।

दण् द्वादश वा बिन्दून् द्वाङ्गुलादवसेचयेत् ।

Cakradatta, *Āśāntanicyūṭṭhāna Adhikāra*.

² Mahāvagga vi. 3.2.

³ Cunningham Cunningham's *Bhilsa Topes*, p. 200.

elliptical mortar is generally used when the medicines require to be thoroughly mixed with some excipient.

The following appliances, besides those mentioned before, become necessary in pharmacy :—

1. Iron pails of various sizes.
2. Vessels of iron, copper, silver, brass and earth for storing medicines.
3. Spoons of wood or darvi ; large metallic spoon or hata.
4. Iron sandañśa or pinchers.
5. Rods of wood or iron.
6. Blacksmith's bellows.
7. Ankuśa or hooks like the elephant driver's goad.
8. Iron hammer.
9. Earthen crucibles of different sizes.

CHAPTER IX.

THE CONCLUSION.

In the recent edition of the *System of Medicine*, Prof. Albutt¹ begins his article on the History of medicine with the following observations: "The medicine of Egypt and the East, extensive and intricate as it was, in so far as it was not Greek did not contain even the rudiments of science. To it Western medicine owes virtually nothing, and in this article at any rate, it may be disregarded". Prof. Osler² also speaks in the same strain: "Crude and bizzare among the primitive nations, these ideas of disease received among the Greeks and Romans a practical development worthy of these peoples. There have been systemes of so-called divine healing in all the great civilizations, but for beauty of conception and for grandeur of detail in the execution, all are as nothing in comparison with the cult of the son of Appolo, and of *Æsculapius*, the god of healing." "Scientific medicine, the product of a union of religion with philosophy, had its origin in a remarkable conjunction of gifts and conditions among the Greeks in the sixth centuries".

Such opinions remind us of an assertion of Sir William Jones³ "that there is no evidence that in any language of Asia there exists one original treatise on medicine considered as science". About a century has elapsed since the time of Sir William but we see that the same misconception still prevails in the minds of

¹ Albutt and Rolleston. *System of Medicine*, vol. I, p. 1.

² Osler and Mcrae's *System of Medicine*.

³ Discourse xi, Sir William Jones's Works, Vol. I, p. 161.

the scholars. Macdonell¹ gives us a succinct account of the intellectual debt of Europe to the various branches of science and art of the Hindus but regrets that the genetic connection of Indian medicine with that of Greece can not at present be definitely settled. "The question as to whether Indian medical science in its earlier period was affected by that of the Greeks can not be answered with certainty, the two systems not having hitherto been compared with sufficient care." The European mind is quite naturally in the habit of tracing all knowledge to Greece, the fountain of all their knowledge in philosophy and science. But impartial writers are not wanting to vindicate the claims of the Hindus. So Wise remarks as follows² :—"Facts regarding the ancient history of medicine have been sought for only in the classical authors of Greece and Rome and have been arranged to suit a traditional theory which repudiated all systems which did not proceed from a Grecian source. We are familiar from our youth with classical history and love to recall events illustrated by the torch of genius and depicted on our memories ; and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found to alter early impressions. Still candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions". Royle maintains³ that "from the mixture, however, of much ignorance and absurdity with what is valuable, many will be apt to despise altogether the medicine of the East. But if it be recollected how long in Europe prevailed the influence of Galen,

¹ History of Sanskrit Literature, ch. xvi.

² Review of the History of Medicine. Introduction.

³ Antiquity of Hindu Medicine, p. 61.

as well as how many absurd formulas still figure in some continental pharmacopœas, as also how comparatively recent is the time since our own was so greatly improved; some feeling of humiliation will control the pride with which we now view the medical sciences". Neuburger says¹; "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them. and owing to its wealth of knowledge, depth of speculation and systematic construction, takes an outstanding position in the history of oriental medicine." It is no doubt unsatisfactory to find that such notions are still allowed to stand in the way of impartial conclusions by eminent men of science especially by those who write history of medicine. But it is not the fault of the historians alone, the fault lies with us for not having supplied them with adequate materials. Something has been done in this field of research by men like Wilson, Heyne, Ainslie, Royle, Dutt, Thacore Shaheb, Jolley, Hoernle and others, but it is nothing when compared to what is required to be done. To supply this want partially, we have endeavoured in this monograph to describe the surgical instruments of the Hindus, with a comparative study of the instruments of the Greek, Roman and Arab surgeons, and of the surgeons in modern times. By a careful study of this subject, we can not avoid the conclusion that the medicine of India though it was not Greek, contained the requirements of science and has a fair claim to be considered in the history of medicine. To it western medicine really owes something and so the subject has been studied and investigated thoroughly.

¹ Neuburger. *History of Medicine*. Trans. by Playfair. Vol. I. p. 437.

Apart from the usefulness of the study for collecting materials for the history of medicine, there are good reasons for a critical examination of the subject. The knowledge of the Hindus in medical science was by no means rudimentary. There is evidence to show that they were inferior to none in the quality or quantity of the knowledge of the science at that early age. Hoernle says:¹ "Its extent and accuracy are surprising when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition." They practised dissection of human bodies and their anatomical studies have the mark of high order. "We have seen that they used various forms of surgical instruments. The Hindus cut for stone cataract for the cataract and extracted the fœtus from the womb". They performed abdominal section, practised cranial surgery successfully and no region of the body was thought sacred to the knife. They repaired nose and ears by plastic operations, treated fractures and reduced dislocations, and were experts in performing amputations. They reduced hernia, cured piles and fistula-in-ano by surgical technique, and inoculated and vaccinated for small-pox. Field surgery was thoroughly understood and arrows were extracted with skill. They were acquainted with the circulation of the blood,"

¹ 'Hoernle's Osteology, Preface, P. iii.

² यामिरिदे शरीरमाराम इव जलहारिणोभिः केदार इव च कृत्वाभिरुपखिद्यते-
ऽनुसृज्यते चाकुञ्चनं प्रसारणादिभिर्बलिशैः । द्रुमपत्रसंयन्तीनामिव च तासां प्रतानास्तासां
यामिर्मूलं तदथ प्रसरन्मूलमथस्तिव्यक् च ।

Sūśruta Saṁhitā, III. vii.

देहस्रोतश्चिरसृजो देहसेनेव धार्यते ।

रक्तं जीवस्य आधारस्तस्याद्रवेदसम्बन्धः ॥

the distinction between the artery and vein,¹ the use of anæsthetics, the means of arresting hæmorrhage and the proper treatment of surgical wounds. They enumerated 107 vital parts of the body to be avoided, if possible, by the surgeon in practising his handiwork.²

In medicine they first propounded the humoural pathology. Though it seems fanciful in the light of modern culture, it must be admitted that no other theory has been attempted to explain the causation of disease in recent times. "They were the first nation who employed minerals internally and to them we owe the therapeutic use of mercury and arsenic in intermittents". They introduced massage, postural treatment and magnet in therapeutics. They excelled in chemistry and contrived many instruments for the preparation of chemical compounds. Atomic theory was discovered by Kaṇāda; and "they knew how to prepare sulphuric acid, nitric acid and muriatic acid, the oxide of copper, iron, lead (of which they had both the red oxide and litharge),

विस्मृता द्रवता रामदलनं विलयलया ।
 भूम्वादिपञ्चभूतानामेते रक्ते गुणाः कृताः ॥
 रक्ते दृष्टे भवेच्छोषो रक्तमण्डलमेव च ।
 अथा दाहश्च पाकश्च कण्डूश्च पीडकोद्भवाः ।
 इहे रक्ताः नेत्रान् शिरासां पूर्णता तथा ।
 नावासां गौरवं निद्रा मेही दाहश्च जायते ॥

Sārāgadhara Saṅgraha, III. xii.

Bhāva Prakāśa, I. ii.

¹ इन्द्रगोपपद्मं श्रेयं प्रकृतिस्त्वसमं हतम् ।

Sārāgadhara Saṅgraha, III. xii.

गूढाः समस्विताः क्षिप्त्वा रोहिण्याः यद्विशोषितम् ।

Ayūṛgā Hṛdaya Saṁhitā, II. iii.

² समोत्तरं मर्मस्थलं ।

Suśruta Saṁhitā, III. vii.

tin, and zinc; the sulphuret of iron, copper, mercury, antimony and arsenic; the sulphate of copper, zinc and iron; and carbonates of lead and iron¹. The processes of solution, calcination and distillation were discovered by them.

They understood the action of drugs and no less than 500 classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases, and their remedial agents have been collected from the vegetable, animal and mineral kingdoms. There are 41 different forms in which the medicaments may be exhibited to the patient. We have the earliest notice respecting zoology and botanical geography in their works. They had a complete nomenclature of diseases which are described minutely as regards their ætiology, symptomatology, diagnosis, pathology, prognosis and treatment.

Veterinary science was well known to them, and treatises on horses and elephants—*Aśvavaidyaka* and *Pālakāpya*² are still extant, and will repay perusal. Even there is a treatise on the treatment of plants and trees³. Thus we see that the Hindu medical science must not be condemned offhand and requires a careful and sympathetic research by scholars, before it can be excluded from the history of the science.

But I must be careful not to allow my enthusiast admiration carry me too far. It is quite true that the Ayurvedic system has its faults. It has been remarked that "it consisted of erroneous

¹ Elphinstone's *History of India*, 8th ed. p. 160.

² Another book on the medicine of elephants is quoted by Alberuni. See Sachau's *Preface to Indica*, p. xl.

³ For the bibliography of the Ayurvedic books, see my work "*Materials, Biographical and Bibliographical, for the History of Hindu Medicine*". (In the press).

doctrines founded upon a most fanciful anatomy, physiology and pathology. Much indeed could hardly be expected of a science based upon an anatomy which taught that the navel "constituted a centre from which a vascular system, including 40 principal vessels originated¹; upon a physiology which declared that these vessels were destined to convey blood, air, bile and phlegm to all parts of the body, and upon a pathology which maintained that disease depended either upon derangements of one or more of these humours or "upon the influence of good or evil spirits".² It must however be remembered that this criticism refers to a theory elaborated some 3000 years before. The idea that the navel formed the centre of the vascular system apparently had its origin in the foetal circulation³. The position of the heart was well-known and its function as a profeelling organ is

१ यावत्सु सिराः काये सन्वन्ति शरीरिणां ।
 नाभ्यां सन्वा निवहन्ताः प्रतन्वन्ति समन्ततः ॥
 नाभिस्थाः प्राणिनां प्राणाः प्राणान्नाभिर्बुध्वायिता ।
 सिराभिराहता नाभिश्चक्रनाभिरिवारकैः ॥

तासां मूलसिराश्चत्वारिंशत्तासां वातवाहिन्यो दश पित्तवाहिन्यो दश कफवाहिन्यो दश दश रक्तवाहिन्यः ।

Suśruta Saṁhitā, III. vii.

तस्मान्तरेण नाभिषु ज्योतिःस्थानं भुवं स्मृतं ।
 तदा धमति वातस्तु दिव्योनास्य बभूवे ॥

Ibid, III. iv.

¹ A course of lectures on the Principles and Practice of Medicine delivered at Calcutta Medical College. By Francis, 1868.

² मातुस्तु खलु रसवद्वायौ नाभ्यां गर्भनाभिनाङ्गौ प्रतिवहता सास्य मातुराङ्गाररस-
 प्रीत्यैमभिवहति । तेनोपकेहेनास्त्राभिहृदिर्भवति ।

Suśruta Saṁhitā, III. iii.

described in the ancient books¹. In the later Tantras the origin of the nerves from the spinal cord and the brain is distinctly stated². The ancient Hindus, like the Babylonians, thought the heart to be the seat of the understanding, and the liver as the central organ of the blood. The Greeks were the most cultured nation at that age, and the knowledge of the two nations can be compared to our advantage. The Hindus did not share with the Greeks the belief that the uterus is "an animal within an animal" and that it can be attracted by pleasant smells and repelled by pungent substances"³. The humoural pathology was also the keystone of the Grecian system. The belief in the good and evil spirit was the only alternative to the pathologists when the microscope and the germ theory of diseases were unknown. It is highly creditable to the classical Greek physicians for banishing superstition from the practice of the art; but we know that the later Greek writers Aetius, Alexander and Paulus, and the Latin medical literature, were not free from its baneful influence. The belief in charms and miracles in the cure of diseases seems to be universal and is

¹ सरसः इत्युच्यते । तस्य च हृदयं स्थानं स हृदयाच्चतुर्विंशतीः धमनीरनुप्रविश्योईमा दश दश चाधोगामिनश्चतस्रस्तियङ्गाः । कृत्स्नं शरीरमहरहक्षपयति बह्वयं धारयति यापयति जीवयति चादृष्टहेतुकेन कर्मणा ।

Saṁruta Saṁhitā, I. xiv.

• डे इ तिर्यङ्गते नाथी चतुर्विंशति संख्यया ।

सिरुदखेच्छिताः सर्वे भूते मक्षिगणाश्च ॥

• • • • •

जल्यमूलमधःशाखं कृत्वाकारं कलिवरं ।

यथावत्प्रदक्षि तदन्तः शरीरे नाड्यस्थिताः ॥

Tantra.

* Paulus Aegineta, Adam's Commentary, Vol. I. P. 636.

working even at the present time. Adams says¹ that "considering the faith which many educated persons now repose in the virtues of galvanic rings and garters, the present generation has little ground for laughing at the credulity of our forefathers, with respect to amulets and other phylacteries".

In later times, attempts have been made to substitute other theories in the place of the humoral, and we know with what results. "Paracelsus substituted an equally baseless hypothesis, that the fundamental element of the human body were three principles: sal, the solid element; quicksilver, the liquid; and sulphur, the aerial. This formula was the badge of the Paracelsist school up to the end of the 17th century." Sylvius and Willi (17th century) of the Iatro-chemical school "referred most diseases to morbid matters or "acrimonies" produced by perverted secretions, and these being sometimes too alkaline, sometimes too acid, the antithesis of acid and alkali became the badge or catch word" of their system. Friedrich Hoffman (1660-1742) constructed another system which "supposed life to be a universally diffused ether, which entering the animal body, became transformed in the brain into Pneuma or nervous fluid. "George Ernest Stahl (1660-1734) believed in the hypothesis of Animism, and "the symptoms of disease were regarded as the conscious efforts of the soul to overcome the morbid influences". William Cullen (1712-90) "propounded a new system of medicine, intended to reconcile the opposing views of his predecessors. Its main feature was the importance attached to the nervous system in the causation of disease." Lastly the "Brunonian" system of John Brown, based on

¹ Adam's Commentary on Paul.

the doctrine of stimulus, and Hahneman's theory of homœopathy need be mentioned here to complete the list.¹ Thus we see that even some of the eminent men of science indulged in fanciful theories in quite modern times.

The study of ancient Hindu medicine has an antiquarian value. It is perhaps the oldest system of medical science still extant. Fragments of Egyptian and Assyrian medicine have no doubt been unearthed. But these cannot be compared with the complete system of the medical science as preserved in the early Sanskrit works on the subject. The Hindus believe their science of medicine to be of divine origin and this belief is founded upon the fact that the existence of the medical profession can be traced back to prehistoric times. The humoural theory is mentioned in the *R̥gveda*² which according to the consensus of opinions amongst the European savants can not be later than 2000 B.C., and possibly earlier. The Buddhists relate a story, how, in one of his former births, Buddha was born as a medicine-man. "In the Mahosadha birth the archangel Sakka came to him as he was being born, and placing some fine sandal-wood in his hand, went away. He came out from the womb holding this in his fist. His mother asked him "What is it you hold, dear, as you come?" He answered "Medicine, mother!" So because he came holding medicine, they gave him the name of medicine-child (*oṣadhadhāraka*). Taking the medicine they kept it in a chatty (an earthenware water-pot) and it became

¹ Medicine in modern Europe. Payne in Albutt's *System of Medicine*, vol. I, p. 26, 29, 34.

² श्रीमान् ब्रह्मीन्मकायं नृपं विधातुं यमं वदतं यमस्यती ।

R̥gveda, I. 34, 6.

a drug by which all the sickness of the blind and deaf and others as many as came, was healed—so the saying sprang up, "This is a powerful drug"; and hence he was called Mahosadha (The great medicine-man).¹ This early date of the science amongst the Hindus is not exceptional. It is now well-known that so severe an operation as trephining the skull was often performed in the early stone age. "Trephined skulls from neolithic period have been found in most European countries, in Algiers, the Canaries, North America, Mexico, Peru and the Argentine"². In the Code of Hammurabi, king of Babylon (2285-2242 B. C.), there are thirteen articles regulating medical practice. One deals with the responsibilities of a surgeon performing operations on the eye. The laws Hammurabi lay down that:—

"If a Physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver.

"If it be a freedman, he shall have five shekels.

"If it be any one's slave, his owner shall give the physician two shekels of silver.

"If the physician make a severe wound with a bronze operating knife and the patient die, or if he open a growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off.

"If a physician make a severe wound on the person of

¹ Rhys David's *Buddhist Birth Stories*, vol. I, p. 67-68.

² *Neuberg's History of Medicine*, P. 3.

a slave belonging to a freed man with the bronze operating knife and kill him, he shall replace the slave by another slave.

"If a physician heal a broken bone or cure diseased bowels, the patient shall pay the physician five shekels of silver."¹

Homer pays tribute to Egypt for her

"Patron-god imparts

To all the Pharian race his healing arts."

Herodotus says that the Egyptian physicians were specialists of particular diseases, and Clement of Alexandria mentions forty-two Hermetic books on medicine by the god Thot.

"According to Manetho, he (Teta) constructed the Royal castle of Memphis and wrote a work on anatomy² being particularly occupied with medicine. The latter supposition is rendered more complete to a certain extent by the account, due to Ebers Papyrus³, that the method of making the hair grow, described accurately therein, was supposed to have been discovered by our king's mother, Shesh."⁴ Teta was the second king of the first dynasty of the old Memphis kingdom and flourished in 4366 B. C. King Senta of the second dynasty owned a medical work which belonged to Senti or Hesepti (4266 B. C.), the 5th king of the first dynasty.⁵ "Tosorthros of the third dynasty, was said to have composed a treatise on medicine,⁶ a fact which

¹ Neuburger. *History of Medicine*, P. 18.

² Manetho, in Müller-Didot, *Fragmenta Historicum Græc.* vol. II, pp. 539, 540.

³ Ebers Papyrus, Pl. lxxi, 1, 5.

⁴ *Historian's History of the World*, vol. I, *Egypt and Mesopotamia*, p. 91.

⁵ *Ibid.*, p. 68.

⁶ Manetho, etc., vol. II, p. 544.

caused him to be identified with the healing god Imhotpá."¹ These facts suggest a great age for Egyptian medicine, Medicine flourished among the Assyrians: "Fragments of an old work on medicine have been found, which show that all known diseases have been classified and their symptoms described; and the medical mixtures considered appropriate to each being compounded and prescribed quite in modern fashion."²

The oldest medical treatise extant amongst the Chinese is the Neiching, the authorship being attributed to Hwang-ti; it dates back to B. C. 2597. Mr. Gatzlaff,³ missionary in China, has given us a short view of a celebrated work, in 40 volumes, on Chinese medicines, which is called Ching che chun ching *i. e.*, "Approved marking line of medical practice."⁴ So the Hippocratic treatises (460 B. C.) are rather modern compilations compared to these ancient books; and as told by Plato, the priest of Sais was fully justified when he addressed to Solon: "You Greeks, you are but children."⁵

It will be seen again that a comparative study of the science discloses remarkable affinity to the systems of the other contemporary nations. The fabulous origin of medicine in India and Greece can not fail to attract the notice of even a casual observer. The resemblance of Dakṣa, the preceptor of the two Aśvins, the offspring of Sun, who after learning the

¹ Ibid, p. 544 and 545.

Quoted in Maspero's "The Dawn of Civilization." Edited by Prof. Sayce, 5th ed. p. 238.

² Assyria; its Princes, Priests and Peoples, Sayce, p. 119.

³ Proceedings of the Asiatic Society, Part VII, p. 154.

⁴ Boyle. Antiquity of Hindu Medicine, p. 67.

⁵ Timæus, p. 22.

Āyurveda from their father became the medical attendants of the gods, to Æsculapius—the reputed son of Apollo, and his two sons Machaon and Podalarius, celebrated in the Homeric poems, is indeed remarkable. More remarkable is the belief in humoural pathology shared by the two nations, separated from each other by continents and seas, and alienated from each other by the differences in customs, manners and religion. The theory of independent origin and developement falls to the ground, especially when we consider the strange coincidence in the surgical instruments used by the two nations in performing surgical operations. Some of the instruments used by the Hindus were not only identical in structure and shape to the instruments of the Greeks, but they had even the same name. Thus for instance, the *alābu yantra* of the Hindus corresponds to the description of the *encurbītula* of the Greeks, and both the terms mean a gourd. A *śrūga* is the horn; *aṅguli yantra* or *mudrikā* is the finger or ring-knife; *yoni-vraṇekṣaṇa* is the diopter or vaginal speculum; *aṅkuśa* is the hook; &c. Some instruments though they have different names are identical in structure and uses. Thus, the *Scammum Hippocraticum* or the *Plinthium Nelei* is the Greek counterpart of the Hindu *kapātaśayana*; the lithotomy binding of the *yantraśatakam*; the clyster of the *vastiyantara*; the saw of the *karapatra*; the needle of the *sūci*; &c. Again many surgical operations are similarly described in both the systems, as for examples, the operations for stone and cataract may be cited. In the description of diseases, passages occur in books which seem to be a literal translation of one from the other. Thus in describing the symptoms of hydrophobia, Paulus quotes Rufus who pronounces it to be a

species of melancholy and then observes "Which reason accords also with those who say that they think they saw the image of the dog that bit them in water". The word "those" in the above sentence becomes clear to us when we read a similar passage in the kalpasthāna of the *Suśruta Sāṃhitā*, and it may be thus translated:¹ "If the patient sees the image of the animal that bit him in the water or mirror, he is sure to die." Other passages might be multiplied but our limited space forbids any further quotations. All these coincidences can scarcely be accidental; and though we may not be able to trace the actual progress of medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt.

Thus the question of the relation of the medical science of the Hindus to that of the Greeks naturally suggests itself for solution. The possibility of a dependence of the one on the other can not be dismissed offhand for we have historical evidence of communication between the two nations at a very early age. We need not dwell at length upon those shoals and quagmires of historical controversies, the alleged conquest of India by Egyptian Seostis as recorded by Diodorus Seculus² in prehistoric times; the connection of the Phœnician traders as proved by the articles of merchandise,—cinnamon, aloes, onyx, agate, ebony, tin and ivory³ diamond, gold and

¹ अयमुवा यदिवादर्शे रिष्टं तस्य विनिर्दिष्टे ॥
 वस्त्रकल्पाद् योऽभोज्यं यत्नादृष्टापि वा जलम् ।
 जलवासनुविद्यात् रिष्टं तनापिकीर्तितम् ॥

Suśrutā Sāṃhitā, V, vi.

² I. ib. I. ch. 43. Nolan.

³ Strabo. xv 37. [Quotes Megasthenes; Theophrastus quoted by MacCrindle in *Ancient India* as described by classical authors, p. 46; Virgil. *Georg.* 11. 116-17 ("India alone produces black ebony"), *Georg.* 1. 57. ("India sends Ivory"), Lonsdale and Lee's trans.; Horace, odes 1. 31.

embroidered work¹ the commercial enterprises of the ships of Solomon (992 B. C.) from Ezion-Gaber² under the guidance of the mariners of Hiram (B.C. 980-917) which brought back the gold of "ophir," its almug trees and ivory, apes and peacocks; the possibility of an Indo-Hellenic intercourse to explain the remarkable coincidences between the systems of philosophy current amongst the two nations, and which culminated in the bold theory of Pococke³ that Pythagoras, who is generally considered to be the founder of the healing art amongst the Greeks⁴ was an adaptation of the Buddhugurus, and the assertion that Greece must have been an Indian colony before. Let us rather tread on firmer grounds and we know that two Greek physicians, Ktesias (about 400 B.C.) and Megasthenes (300 B. C.) visited Northern India. Ktesias in his *Indica* mentions the cochineal plant, its worm and dyes, monkeys, elephant and parrot. He says that the Indians were free from headache, toothache or ophthalmia and from mouth sores or ulcers. Alexander the Great (B.C.327), so says Nearchus, employed some Hindu vaids in his camp in India to consult them in cases of snake-bites and other dangerous ailments. Megasthenes mentions ebony as growing in Bengal, and tiger, monkey and elephants are also alluded to. Strabbo mentions that Daimacus was sent to the court of Candragupta's son, but unfortunately the book he wrote about India is lost to us. Mention also should be made of the intercourse of Egypt with India under the Ptolemies and we know, that Ptolemy

¹ Birdwood's *Industrial Arts of India*, pp. 263-4.

² I. King. ix. 27; xii, p. 22.

³ *India in Greece*.

⁴ See the *Origin and Growth of the Healing Art*—Beddoe. 169.

Philadelphous sent an embassy headed by one Dionysos to the court of Pātaliputra. Another source of dissemination of Hindu learning over the Western world is the emigration of the Buddhist missionaries to the kingdoms of Ptolemies and Greek kings as proved by the edicts of Aśoka. "And the Greek Simnoi (venerable) were no other than the Buddhist sramanas (these simnoi whom Clement of Alexandria has narrated to have rendered worship to a pyramid originally dedicated to the relics of a god, were the Buddhist Arhats (venerable) sramanas).¹ The intercourse of the East and West after the Christian era is well known and will not supply us with any proof as to the indebtedness of the Greeks and Hindus to each other; though "Dietz proves that the late Greek physicians were acquainted with the medical works of the Hindus, and availed themselves of their medicaments"; but he more particularly shows that the Arabians were familiar with them, and extolled the healing art as practised by the Indians, quite as much as that in use among the Greeks."²

But what is more important to us as a proof of the influence of the Indian medical science upon the Grecian system is the identification of drugs of Indian origin in the *meteria medica* of the Greeks. For instance the Sacred Bean of Pythagoras has been identified with Utpalam or Indian Nelumbium.³ Hippocrates the Great, who was contemporary and kinsman of Ktesias⁴ the court physician to the king of Persia, mentions:—*Sesamum Indicum* (Tila); *Nardostachys Jatamansi*

¹ Lalitvistaram. Mitter's ed. ch. 1.

² *Journal of Education*, Vol. viii, p. 176.

³ Pratt's Flowering Plants, Vol. 1, p. 67.

⁴ Galen; Comment, in libr. de artic. iii.

(Jaṭāmāṁsī); Beswillia Thurifera (Kundurū); Zinziber Officinale (Śrīgavera); and Piper Nigrum (Marīci). Dioscorides (1st century A.D.) in his *Materia Medica* describes:—Agallochum, Bdellium, Ebony (Diosphynos Ebenaster), Ammomum zinziberis (Ginger), Calamus aromaticus (sweet cane of Scripture), Eletteria Carlamonum (Elaci), Lycium Indicum or Russot, the product of Berbera lycium, Atramentum (Indigo), Onyx or the operculum of an Indian shell-fish, etc. In later times, we find Aetius, an Alexandrian writer of the 5th century describing Indian nuts, sandal wood, cocoanuts, etc. Symon Set mentions camphor; and Paulus Aegineta (7th century A.D.), a writer well known for his judicious condensation of the Greek medical literature, mentions Aloes, Cantharides (Mylabris Cichory), Cloves (Caryophyllum Aromaticus), Millet (Panicum Halicum), Costos (root of Aucklandia Costos), Cassia (Cinnamomum Cassia), Indian stones as amulets, Malabathri or tejpat (Laurus Cassia), Ambar, etc.

Now let us reproduce some of the conclusions arrived at by Western scholars as the result of the controversy. As regards philosophy, Colebrooke¹ asserts that "the Hindus were teachers and not learners". Cunningham² says: "Indians have the advantage in point of time; and I feel satisfied that the Greeks borrowed much of their philosophy from the East" Weber³ remarks that "there is no ground whatever to suppose that Susruta borrowed his system of medicine from the Greeks, on the contrary there is much to tell against such an idea".

¹ Transactions of the Royal Asiatic Society, vol. I.

² Bhilsa Topes, pp. 32-33.

³ History of Indian Literature,

Prof. Diaz of the Konnigsberg University, detects the principles of Indian medicine in the medical literature of the Greeks". "It is to the Hindus" says Wise, "we owe the first system of medicine." Royle has proved beyond doubt the indebtedness of the Greeks and Arabs to the Hindus. Haas's theory that *Suśruta* is the Indian adaptation of the Arabic name of *Suqrat* or *Buqrat*, the Arabic corruption of the Greek Hippocrates, and that *Kāśi* is an adaptation of the Island of *Cos* has been deservedly condemned as "an elaborate joke". Neuburger says:¹—"The similarity between Indian and Greek medicine of the period is in its outline and in certain details so striking that it is hardly surprising that the originality of the former has frequently been questioned or even denied. The more so is this true since the dates of the more important Indian works are fixed with the greatest difficulty, and before the discovery of the most recent manuscripts they were quite indefinite.

In consideration of the outstanding independent achievements of the Indians in most branches of science and art, and of their aversion from foreign influences, the trend of opinion to-day, informed by recent discoveries is in favour of the originality of Indian medicine in its most salient features."

Another fact must here be pointed out that the Hindus always acknowledged any help they might have received from other nations for the development of their science. The striking proof of this is found with reference to the science of astronomy—the only branch of learning which seems to have been influenced by the Greeks. *Varāhamihira* compiled his famous *Pañca-sidhāntica* or the collection of the five old treatises on astronomy,

¹ Neuburger. *History of medicine*, Vol. I, p. 45.

viz., Paulisa, Romaka, Vasiṣṭha, Saura, and Paitamohia. Both Weber and Kern have no doubt that Paulisa was a Greek and the name Romaka speaks for itself. But in the Hindu medical literature there is no mention of any foreign help, and the Indian medical treatises do not contain a single technical term which points to a foreign origin. It is interesting to quote the well known passage of Garga: "The Yavanas (Greeks) are Mlecchas, but amongst them the science (astrology) is well established. Therefore they are honoured as R̥is—how much more than an astrologer who is a Brāhman". It is a standing monument of the catholic spirit of the Hindus, and they know no better way to show their respect for the learned men of the world. To this may well be contrasted the behaviour of the Greeks towards the other nations. The doctrines of Pythagoras are pre-eminently Indian¹, but that philosopher has not a word to speak of the Hindus. In astronomy the Greeks are indebted to Babylon: Ptolemy mentions that Hipparchus worked out and improved upon the astronomical computations of the Babylonians with reference to the moon; but recent discoveries from the clay tablets have shown that the figures ascribed to Hipparchus are merely copied from the numerical values worked out in Babylon. "The discovery of the precession of the equinoxes is generally ascribed to Hipparchus. It was he indeed, who brought this fact to the Greeks, and he estimated its yearly amount as from 36 to 39 seconds, but it is certain that he learned about it in Chaldea, and that he obtained the elements of his calculations from the astronomical observations made on the lower Euphrates".² Paulus Aegineta

¹ See Enfield's History of Philosophy.

² Historian's History of the World. Vol. I, p. 596.

gives us a complete system of operative surgery of the ancients. Celsus, in the last two books of his work, has treated of the surgical operations with considerable accuracy; and though the former availed himself of the labours of the latter, Celsus is never mentioned as one of the sources of informations used by Paulus who appears to have been wholly unacquainted with his works; and Adams remarks "but when did a Greek writer ever acknowledge himself under obligation to a Roman"?

But are we to suppose that the Greeks wilfully concealed the names of the Indian physicians in their books? Surely not. The Greeks might not have known the real source of the informations which they probably received second-hand. There is historical evidence of an intercommunication between Greece and Persia from the time of Ktesias or the 4th century B. C. to the 6th century A. D. We also know of a tradition that the services of the Great Hippocrates—a kinsman of Ktesias, were required in the Persian court, but he declined the invitation. Again we know that books on ancient sciences of India were possibly made use of by the Persians in early times, and to this intercommunication may be due "the coincidences which have been observed between the science of the Greeks and that of the Hindus" (Royle).

As regards the indebtedness of the Persians to Sanskrit literature, "we have positive testimony on the subject, as the Baron de Saey, in his account of the well-known Sanskrit origin of the Fables of Pilpay, states that these were first translated in Pehlevi during the reign of the Persian king Nooshirwan, who ascended the throne in 531, and died in 579 and who is reported by historians to have encouraged learning, and to have induced Grecian philosophy at his court. The translation

were made by the physician Barzouyeh who had brought the original from India with other books, and who by more than one previous journey to that country, had acquired a knowledge of Sanskrit. He is stated particularly, to have made two journeys, one for the purpose of procuring medicaments and herbs, and the other for obtaining specimens of literature of the Hindus"¹. "Previous even to this (A. D. 330), we hear of the Persian king Bahram visiting, in disguise, the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus."²

But whatever differences of opinion there may be as regards the relation of the Greeks to the Hindoos, there is no doubt that the medical science of the Arabs was materially influenced by Hindu medicine. For we know that the medical treatises of Caraka, Suśruta and Mādhava were translated into Arabic in the beginning of the 8th century A. D., and the names of Scarae, Scirae or Xarac and Sarad occur in the Latin translations of Avicenna, Rhases, and Serapion.³ Rāy dwells at length on the similarity of description of leeches as written by Suśruta and Rhazes. The modern medical science of the West is principally based on the Grecian system as preserved in the books of the Arabian authors and so indirectly depends for some particulars at least upon the Indian system.

Sachau in his preface to Alberuni's India⁴ remarks as

¹ *Antiquity of Hindu Medicine*, p. 168-69.

² *Ibid*, p. 73.

³ Rhazes: 'De Emblico,' (Scarae Indianna), 'De Zinzibore, (Sarac) Serapion: 'De Myrobalanis' (Xarch Indus), 'De Emblicis et bellericis (Xarcha Indus); Avicenna: 'Sub Emblico' (Scirac Indum).

⁴ *Alberuni's India*, Preface, p. lxx-xxxi.

follows:—"What India has contributed reached Bagdad by two different roads. Part has come directly in translations from the Sanskrit, part has travelled through Iran, having originally been translated from Sanskrit (Pali? Prakrit?) into Persian, and further from Persian into Arabic. In this way, *e.g.* the fables of Kalila and Dimna have been communicated to the Arabs, and a book on medicine probably the famous Caraka. *cf.* Fibrist p. 303". The Arabs also translated "Indian works on snakes (*sarpavidyā*), on poison (*viṣavidyā*).....on the veterinary art¹.....But not only were the medical books translated into Arabic we have evidence that Indian doctors practised in foreign courts. Sachau continues:² "Another influx of Hindu learning took place under Harun (A. D. 786-808). The ministereal family Barmak, then at the zenith of their power, had come with the ruling dynasty from Balkh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar, *i. e.*, *nava vihāra*—the new temple (or monastery). The name Barmak is said to be of Indian descent, meaning *paramaka*, *i. e.*, the superior (abbot of the *vihāra*?) *cf.* Kern, *Geschichte des Buddhismus in Indien*, ii. 445, 543. Of course, the Barmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions, they sent scholars to India, there to study medicine and pharmacology. Besides, they engaged Hindu scholars to come to Bagdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit

¹ Alberani's *India*, Preface, p. xxxiv.

² *Ibid* p. xxxii.

into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries, muslim scholars travelled for the same purpose as the emissaries of the Barmak, *i. g.*, Almuwaffak, not long before Alberuni's time (Codex Vindobonensis, sive medici Abu Mansur liber, fundamentorum pharmacologie, Ed. Selignann, Vienna, 1859, pp. 6, 10, and 15, 9)."

"Harun-al-Rashid (786-809) had two Indians Manka and Saleh, as physicians at his court"¹ Manka translated the classical work on medicine, Susruta (*cf.* Steinschneider, Wissenschaftliche Blätter, Vol. 1, p. 79) and a treatise on poison, ascribed to Kānakya, from Sanskrit into Persian (see Prof. Flügel, in Zeitschrift der D. M. G. xi. 148 and s. 325). A Hebrew treatise on poison, ascribed to the Indian Zanik (Kauakya) is mentioned by Steinschneider Wissenschaftliche Blätter, Vol. 1, p. 65). Alberuni mentions an Indian Kankab as astrologer of Harun-al-Rashid (Reinaud, memoire sur l'Inde, p. 315). He is likewise mentioned as a physician. Another Indian physician of Harun-al-Rashid is called Mankba (Reinaud). In the year 1381, a work on veterinary medicine ascribed to Salotar was translated from Sanskrit by the order of Firroz Shaha after the capture of Nagorecote. A copy of it was preserved in the Royal Library of Lucknow². Among the Hindu physicians of the time one ابن دهن is mentioned *i.e.*, the son of DHN, director of the hospital of the Barmaks in Bagdad. This may be Dhanya, or Dhamian chosen probably on account of its etymological relationship with the name Dhanvantari the name

¹ Prof. Dietz, quoted by Boyle, p. 64.

² Maxmüller's Science of Language, Vol. I, p. 166.

of the mythical physician of the gods in Manu's law book and the epics (*cf.* A Weber, *Indische Lithuraturgeschichte*, pp. 284, 287). A similar relation seems to exist between the names Kanka, that of a physician of the same period, and Kankayana, an authority on Indian medicine (Weber *l. c.*, pp. 287, note, and 284 note, 302). The name *اكر*, that of an author of a book on drinkables, may be identified with Atri, mentioned as a medical author by Weber, *l. c.* p. 288.²¹

For informations on the Arabic translations of Sanskrit works, see *Analecta Medica* by Dietz; Wustendeld's *Geschichte der Arab Aerzte*; Cureton, "A collection of such passages relative to India as may occur in Arabic writers"; Wilson's note to the above in *J. R. A. S.* old series, vi, pp. 105-115. Puschmann, p. 162; and Bedræ, book iv. ch. 11. pp 286-299.

The Arabians added many drugs to the *meteria medica* of the Greeks and amongst them we find the following Indian drugs described:—

Diudar or Pinus Deodara.....	Devadāru ²
Artemesia Indica.....	Nāgdamani.
Piper cubeba.....	Sugandha marica.
Cassia fistula.....	Suvarnakha.
Senna or Cassia obrata.....	Sonāmukhī.
Galangal or Alpina galangal, Roxb.....	Kulin-jana.
Ammomum grana paradisi.	
Macis.....	Mace.
Nux moschata.....	Nutmeg.

¹ Sachau. *Ibid* p. xxxii.

² It is described by Avicenna under its Sanskrit name, where he says that diudar, "est ex genere abhel juniperus, que dicitur pinus Inda; et syridindar est ejus lac" (Quoted by Royle).

Bdellium.....	Guggula.
Tamarindus Indica.....	Tintidī.
Trifolia.....	Triphala. ¹
Myrobalani.....	Haṭitaki.
Turpeth or Convolvulus Turpethum.....	Trivit.
Sel or Aegle marmelos.....	Vilva.
Santalum rubrum.....	Candana.
Melia azadirachta.....	Nimba.
Tembul (Piper betel).....	Tāmbūl.
Faufl (Areeha catechu).....	Khadira.
Nux vomica.....	Viṣamuṣṭi.
Musa paradisiaca or plantain.....	Kadali.
Moschos moschifera (from Thibet & India).....	Mṛganābhi.
Dolichos lebleb.	
Orange or Citrus aurantium.....	Nāgaraṅga.
Limon or citrus medica.....	Mātuluṅga.
Pearls and other precious stones such as lapis lazuli. Borax, &c.	
Rhabarbarnum or Indian Rhubarb, etc.	

We can trace the Arabic and Greek names of some of the medicaments to a Sanskrit source. Royle has discussed them at length, so we need give here only a synopsis of it:—

Triphalā (S)—Tryphalla (A)—Tryphalla (G)—Tryphala parva (modern).

Devadāru (S)—Deudar(Avicenna)—Deodara (G)—Pinus deodaru.

Tvaka-kshira (S)—Tabosheer (A).

Tamālpatra (S)—Malatroon or Malabathrum (G).

Tejapatra(s), or tuj—Sadej (A).

¹ Actuarius copies from Serapion and Mesue, the use of this medicine. The very name is Sanskrit, meaning the 3 myrobalani. Serapion refers to Xarch Indus or Charak, in his De Myrobalani (Royle, P. 27).

Tāmbula (S)—Tumbol (P)—Tunbol (A).

Pippalī (S)—Pippul (H)—pilpil (P)—filfil (A)—(G)—
piper (E).

Sṛṅgavera (S)—Shingveez (P)—Zinzabil (A)—Zingiber (E).

Aguru (S)—aggur (H)—Agila (M)—Pao-d'aglia (aquilia)
(po)—Aod Hindee Agallochum (G).

Candana (S)—chundan (H)—Shandana (T)—Sundul (P)—
Santal (E).

Kolinjana (S)—Galanga (G).

Vaca (S)—Wuz (A).

Dāvrusita (S)—Darcheeni (H)—Darsheeni (A).

Caeyn-nama (C)—Akimona (P)—Kaimanis (M)—Cinnamon.

Kuṣṭha (S)—Kooth (H)—Kust (A)—Koosrus (G)—
Koshta (Sy).

Abnus—Ebony (E).

Kubara (S)—pupal (P)—fufal (A).

Sajikā (S)—Sajiimattee, sajiloon, saji (H)—Sajimen vitri
(Geber)—Soza or soda (E).

Khar, khari (S)—Kali. (A).

Kussas, missey (India)—misy (A)—misy (G).

Tincana (borax)—Tinkar (P)—tincal (E).

Ambara (S)—Kharoba (A)—Amber, Ambegrise (E).

Kassis (tin)—Kassiteros (G).

Tuttha (S)—tootum or tutia (H)—tutia (P)—tatanagum
(T)—tutenagun and tutty.

Manasīlā (S)—Mansil (G).

Haritāl (S)—hartal.

Sarkarā (S)—sakkara (T)—sukkur (A)—Sugar (E).

Sandaracha (S) or sulphuret of arsenic—Zarnach (P & G).

Sphotaka (S)—phoska (B)—pocca (A. S.)—pocke (Ger).

Tintidi (S)—Tamar Hind (A)—Tamarin (Fr)—Tamarinds
(Italy & Sp.)—Tamarind (B)—Tamarindus India (L).

Masurikā (S)—Masern (Ger)—Measles (E).

Vraṇa (S)—verole (Fr)—variola (L).

Danga (Hindus)—Dandy—Dengue (Sp).

S—Sanskrit. A—Arabic. G—Greek. T—Tamil. P—
Persian. M—Malayan. Po—Portuguese. Sy—Syriac. Ger
—German. A. S.—Anglo-Saxon. H—Hindi. E—English.
B—Bengali. Fr—French. L—Latin. It—Italy. Sp—Spanish.

Not only is the influence of the Sanskrit medical works detected in the Persian, Hebrew, Arabic, Greek and Roman works on medicine, there is evidence that the Hindu system of medicine was also adopted by the Tibetans and the Chinese. In the January No. 37 of the J.A.S.B. 1835 Vol. IV, an analysis of a Tibetan work is given by Alexander Csoma de Koros. It is called "rgyud bzhi" (the tract in 4 parts). It is attributed to Sakhya. "In the time of Khrisrong Dehutsan (*i.e.* 8th or 9th century of the Christian era) a Tibetan interpreter Bairotsana (or Vairochana) having translated in Cashmere, with the assistance of physician-pandit (Davam Non-gah) presented it to the above mentioned Tibetan king." In a Note on Tibetan surgical instruments, Walsh says: "The present practice of surgery in Tibet is very simple, and, as already noted, consists chiefly of cupping, cauterizing, and bleeding. The Am-chhi informed me that the only instruments used are the cupping-bow (མེའུ་ me-puḥ, or མེའུ་ me-bam, both meaning 'fire vessel'), in which

¹ The Tibetan Anatomical System by E. H. C. Walsh in J. R. A. S. 1910, pp. 1244-45.

paper is lit and the bowl is placed while hot over the part to be blistered; the sucking-horn (འཇིབ་རུ་ *ajib-ru*), by which cupping by vacuum is done; the cautery (ཐུགས་མེ་ *thags-me*), the lancet (རྩ་ཕུ་ *risa-u*),* for bleeding, and a golden lancet (གསེར་གྱི་རྩ་ཕུ་ *gser kyi risa-u*) for operating on the eye.

In the journal of the Buddhist Text Society of Calcutta for 1894 three Tibetan block prints are illustrated, which contain representations of a large number of surgical instruments, some of them of an elaborate nature, including specula, saws, catheters, exploring needles, instruments for tapping hydrocele, and midwifery and other forceps. The block-prints were brought by Rai Saratchandra Das, Bahadur, from Lhasa,¹ and a description of the figures was given by the late Lama Śes-rab MGya Mtsho, the Abbot of Ghoom Monastery, near Darjeeling, who was formerly physician to the late Tashi Lama, which were explained in a paper read by Dr. Saradaprasad Banerjee.²

If the elaborate and various instruments shown in the block-print were ever in general use they appear to have now ceased to be used."

In the J.R.A.S. April 1907, is mentioned "a Chinese text corresponding to a part of the Bower manuscript" by Watanbe. The identified portion of the MSS. consists of the six leaves which appear in plates XLIX-LIV (Hoernle's ed). The corresponding Chinese text is contained in six translations of which the following three, correspond completely to the MSS.

¹ Journal of the Buddhist Text Society, Vol. II, Pt. III, Calcutta 1894. P. III.

² Ibid, pp. IX. X.

<i>Alhagi maurorum</i>	...	Yavasa.
<i>Alstonia scholaris</i>...	...	Saptaparna.
<i>Amomum elettarum</i>	...	Ela.
<i>Andropogon nardus</i>	...	Ushira.
<i>Andropogon schænanthus</i>	...	Katorina.
<i>Artemisia sternutatoria</i>	...	Agnidamani.
<i>Berberis lycium</i> ...	...	Daruharidra.
<i>Butea frondosa</i> ...	...	Palasha.
<i>Cassia lanceolata</i> ...	...	Sonamukhi.
<i>Cucumis colocynthis</i>	...	Indravaruni.
<i>Dhatura alba, niger &c.</i>	...	Dhattura.
<i>Justicia adhatoda</i>...	...	Atarusha.
<i>Luffa amara</i> ...	...	Katukoshtaki.
<i>Linum usitatissimum</i>	...	Atasi.
<i>Mallotus Philippiensis</i>	...	Kapillaks.
<i>Myrica sapida</i> ...	...	Katfala.
<i>Ophelia chiretta</i> and <i>Ophelia</i> <i>angustifolia</i> ...	...	Kirata.
<i>Pimpinella Anisum</i>	...	Shatapushpa.
<i>Pongamia glabra</i>...	...	Karanja.
<i>Ptychotis ajowan</i> ...	...	Ajamoda.
<i>Ricinus communis</i>	...	Eranda.
<i>Salvinia cucullata</i>	...	Undurkarnika.
<i>Santalum album</i> & <i>Santalum</i> <i>flavum</i> ...	...	Chandana.
<i>Shorea Robusta</i> ...	...	Ajakarna.
<i>Strychnos potatorum</i> , <i>Strychnos</i> <i>nux vomica</i> ...	...	Katakafala.
<i>Tinospora Cordifolia</i>	...	Guḍuci.

Valeriana Hardwicki	...	Tagara.
Wrightia Antidysenterica	...	Indrayava."

To this list may be added the following drugs from the Indian and Colonial Addendum to the British Pharmacopœa, 1898:—

Acacia Arabica	...	Vāvvula.
Acalypha Indica	...	Muktabarāṣi.
Andrographis Paniculata	...	Kirāta.
Aristolochia Indica	...	Arkamula.
Arachia Hypogaea	...	Bucanaka.
Citrus Aurantium	...	Nāgarāṅga.
Azadirachta Indica	...	Nimba.
Aegle Marmelos	...	Vilva.
Piperbetel	...	Tāmbula.
Buttea Gummi.		
Cesalpina Sappan.	...	Patanga or Bakam.
Calotropis Procera and C. Gigantie	...	Arka.
Gossypium Herbaceum	...	Kārpāsa.
Cambogia Indica.		
Cissampelos Pariera	...	Ambashthai.
Coscinum Penestratum	...	Dāru-haridrā or darvi.
Gynocardia Odorata	...	Chālmugra.
Hygrophila Spinosa	...	Kokilākṣa.
Anogeissus Latifolia		
Embelia Ribes and E. Robusta.	...	Viṣṇaṅga.
Plantago Ovata	...	Ispaghula.
Ipomœa Hederacea	...	Kālādāna.
Ipomœa Turpethum	...	Trivṛt.

Mylabris Phalerta.

Terminalia Chebula ... *Haritaki.*

Sesamum Indicum ... *Tila.*

Picrorhiza Kurroa ... *Katuka.*

Urginea Indica ... *Vanapālāṇḍu.*

As regards the medicines used by the Hindus, Neuburger says¹ :

"The Pharmacopia, corresponding with the fruitful nature of the land was a rich one and stamps Indian medicine with a character entirely its own, whilst nothing speaks more eloquently for its originality than the fact that of all the many medicinal plants no single one was European."

Elphinstone wonders at the knowledge of simples in which the Hindus early gave lessons to Europe and "more recently taught us the benefit of smoking *Datura* in asthma and the use of cowitch against worms," and "the prescribing of *Nux Vomica* in paralysis and dyspepsia, and the revival of the use of *Croton Tiglium*" (Royle). In surgery, too, the modern surgeons of Europe have borrowed the Indian method of Rhinoplastic operation first made known to European surgeons by a letter which was printed in the *Gentleman's Magazine* for October 1794, p. 891. In fact Dr. Hirschberg of Berlin says that "the whole plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us. The transplanting of sensible skin flaps is also an entirely Indian method." The modern method of making pockets for the

¹ Neuburger, *History of Medicine*, vol. I. P. 54.

testicles under the Colles' fascia after the operation for scrotal tumour (elephantiasis) can be traced back to the age of Suśruta¹.

Thus we see that it can safely be affirmed that the medical science of Europe has been, both directly and indirectly, influenced by the Hindu System of Medicine.

¹ पादौ निरक्तमुष्णस्य जलेन प्रोक्ष्य चाविष्यौ ।

प्रविश्य तुम्बसेवया मुष्णौ सौख्यं गतः परं ॥

Suśruta Saṁhitā, IV. ii.

THE END.

APPENDIX.

I¹Tsing¹ says :—

“The following are the eight sections of medical science. The first treats of all kinds of sores; the second, of acupuncture for any disease above the neck; the third, of the diseases of the body; the fourth, of demoniac disease; the fifth, of the Agada medicine (i.e. antidote); the sixth, of the diseases of children; the seventh, of the means of lengthening one's life; the eighth, of the methods of invigorating the legs and body. ‘Sores’ (1) are of two kinds, inward and outward. The disease above the neck (2) is all that is on the head *and face*; any disease lower down from the throat is called a ‘bodily’ disease (3). The ‘Demoniac’ (4) is the attack of evil spirits, and the ‘Agada’ (5, but 6 of Āyur-veda) is the medicine for counteracting poisons. By ‘Children’ (6, but 5 of Āyur-veda) is meant from the embryonic stage until after a boy's sixteenth year; ‘lengthening life’ (7) is to maintain the body so as to live long, while ‘invigorating the legs *and body*’ (8) means to keep the body and limbs strong and healthy. These eight arts formerly existed in eight books, but lately a man epitomized them and made them into one bundle. All physicians in the five parts of India practise according to *this book*, and any physician who is well versed in it never fails to live by the official pay. Therefore Indians greatly honour physicians and much esteem merchants, or if they do not injure life, and they give relief to others as well as benefit themselves. I made a successful study in medical

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 127-8.

science, but as it is not my proper vocation I have finally given it up."

Dr. Takakusu¹ comments on the passage as follows :—

"The eight sections of Medicine which I-tsing describes are no doubt the eight divisions of the Āyur-veda. He mentions an epitomiser of these divisions, who seems to have been a famous physician and contemporary of I-tsing (or just before I-tsing). This epitomiser may be Suaruta, who calls himself a disciple of Dhanvantari, one of the Nine Gems in the Court of Vikramāditya.

Prof. Wilson says in his Works, vol. iii, p. 274 :—

"The Āyur-veda, which originally consisted of one hundred sections, of a thousand stanzas each, was adapted to the limited faculties and life of man, by its distribution into eight subdivisions, the enumeration of which conveys to us an accurate idea of the subject of the *Ars Medendi* amongst the Hindus.

The eight divisions are as follows :—

I. Sāl̥ya (I-tsing's (1) cure of sores).

The art of extracting extraneous substances, grass, earth, bone, &c., accidentally introduced into the human body, and by analogy, the cure of all phlegmonoid tumours and abscesses. Sāl̥ya means a dart or arrow.

II. Sālākya (I-tsing's (2) art of acupuncture).

The treatment of external organic affections or diseases of the eyes, ears, nose, &c. It is derived from Sālākā, "a thin and sharp instrument," and is borrowed from the generic name of the slender probes and needles used in operation on the parts affected.

¹ A Record of Buddh's Practices, Ch. XXVII, pp. 222-3.

The above two divisions constitute the surgery of modern schools.

III. *Kāya-kikitsā* (I-tsing's (3) treatment of the diseases of the body).

The application of the *Ars Medendi* (*Kikitsā*) to the body in General (*Kāya*). It forms what we mean by the science of medicine.

IV. *Bhūta-vidyā* (I-tsing's (4) treatment of demoniac disease).

The restoration of the faculties from a disorganised state induced by demoniacal possession. The art vanished before the diffusion of knowledge, but it formed a very important branch of medical practice through all the schools, Greek, Arabic, or European.

V. *Kaumāra-bhṛitya* (I-tsing's (6) treatment of the diseases of children).

The care of infancy, comprehending not only the management of children from their birth, but the treatment of irregular lactic secretion, and puerperal disorders in mothers and nurses.

VI. *Agada* (I-tsing's (5) *Agada* medicine).

The administration of antidotes—a subject which, as far as it rests upon scientific principles, is blended with our medicine and surgery.

VII. *Rāsāyana* (I-tsing's (7) application of the means of lengthening one's life).

Chemistry, or more correctly alchemy as the chief end of the chemical combinations it describes, and which are mostly

metallurgic, is the discovery of the universal medicine—the elixir that was to render health permanent, and life perpetual.

VIII. *Vāgīkarawa* (I-tsing's (8) methods of invigorating the legs and body).

Promotion of the increase of the human race—an illusory research, which, as well as the preceding, is not without its parallel in ancient and modern times.'

Prof. Wilson further remarks:—'We have, therefore, included in these branches all the real and fanciful pursuits of physicians of every time and place. *Susruta*, however, confines his own work to the classes *Sālya* and *Śālākya* or surgery: although, by an arrangement not uncommon with our own writers, he introduces occasionally the treatment of general diseases and the management of women and children when discussing those topics to which they bear relation.' (See *Wilson's Works*, vol. iii, p. 276.)"

List of Works Consulted.

Actius.

Alexander Trallianus.

A l'histoire du Badh. Ind.

Analecta Medica—Dietz.

Analysis of a Tibetan work on Medicine (J. R. A. S.)—Csoma de Koros.

Anglo-Saxon Medicine—Payne.

Antiquities of Orissa—R. L. Mitra.

Antiquity of Hindu Medicine—Royle.

Archaeological Survey of South India—Burgess.

Architecture of India—Ram Raz.

Aristophanes.

Arnual de Chirug.

Assyria—Sayce.

Aṣṭāṅga Hṛdaya Saṁhitā—Vāgbhaṭa II (Kunte's Ed.).

Aṣṭāṅga Saṁgraha—Vāgbhaṭa I.

Aśvavaladyaka—Jayadatta Suri.

Atharva Veda—Whitney's Translation.

Avenzoar.

Avicenna.

Āyurvedārthadīpikā—Śivo Dasa Sena.

Bhāgavat—Vyāsa.

Bhānumatī—Cakradatta.

Bhāva Prakāśa—Bhāva Miśra.

Bhīṣa Topes—Cunningham.

Bhoja Prabandha—Ballāla (Jīvānanda Ed.).

Buddhist Jataka Stories—Rhys David.

Buddhist Records of the Western World—Beal.

Cakradatta—Cakradatta.

Cancer of the Breast—Volpenu.

Caraka Saṁhitā— $\left\{ \begin{array}{l} \text{Agnivesa.} \\ \text{Caraka.} \\ \text{Dṛghavala.} \end{array} \right.$

Caturvarga-Cintāmanī—Hemādri.

Celsus.

Chirrug.—Albucasia.

Cikitsā Sāra Saṁgraha—Cakradatta.

Collection—Orientalia.

Commentary on Manu Saṁhitā—Kallāka Bhaṭṭa.

Dawn of Civilization—Maspero.

De Chirurgiens Grecs.

- De Med. Aegyptiorum—
 Dhanurveda.
 Discourse xi—Jones.
 Description of Hindustan—Hamilton.
 Domitan.
 Early History of India—V. Smith.
 Ed. Med. Essays—Simpson.
 English Translation of Sākṛta Saṁhitā—Datt, Hoernle and Chattopādhyā.
 Extant Works of Aristotle—Adams.
 Flowering Plants—Pratt.
 Fractures and Dislocations—Hamilton.
 Galen.
 Genuine Works of Hippocrates—Adams.
 Geography—Strabbo.
 Græco-Roman Surgical Instruments—Milne.
 Gun Shot Injuries—Longmore.
 Hārta Saṁhitā—Hārta.
 Hasti-Āyurveda—Pālakāpya.
 Hindu Medicine—Wise.
 Hist. de la med.—Springel.
 Historia Forcipum et Vecticum—Mald.
 Historian's History of the World.
 History of Aryan Medical Science—Thakore Sahab.
 History of Hindu Chemistry—Rāy.
 History of India—Elphinstone.
 History of Medicine—Neuberger.
 History of Philosophy—Enfield.
 History of the Saracens—Amir Ali.
 History of Sanskrit Literature—Weber.
 India—Alberuni—(Translated by Sachau).
 India in Greece—Pocock.
 Indian Antiquities—Prinsep and Thomas.
 Indian History—Arrian.
 Indian Medicine—Jolly.
 Indian Physicians at Bagdad—Wilson (J. R. A. S.).
 Indian Tracts—Heynes.
 Indo-Aryans—R. L. Mitra.
 Industrial Arts of India—Birdwood.
 Invasion of Alexander the Great—M'crindle.
 Journal Asiatic Society Bengal, XXXIX 1870 and vol. XLII. 1885.
 Journal Asiatique 1896.
 Journal of Education, vol. VIII.
 Journal Royal Asiatic Society, 1906-1907.
 J. R. A. S. (Bombay Branch), vol. XX.

- Juvenal.
 Kaṭhopanishad.
 Kauṣika Sūtra—Bloomfield.
 Laghumañjusā—Nagoṣa Bhāṭṭa.
 Lalitristāraṇa—Mitra.
 Lancet, 1845.
 Latin Translation of Sn̄ruta Saṁhitā—Hessler.
 Mahābhārata—Vyāsa.
 Mahānīla Tantra.
 Mahāvāgga—S. B. E.
 * Mahāvārha.
 Mālavikāgnimitra—Kālidāsa.
 Māna Sāra.
 Manu Saṁhitā—Manu (Jones Ed.)
 Materia Medica of the Hindus—Dutt.
 Medicine in Ancient India—Hoernle (J. R. A. S.)
 Memoire Sur L'Inde—Reinand.
 Mesue.
 Midwifery—Smellie.
 Natural History—Pliny.
 Nidāna—Mādhavakara.
 Nīti Sāra—Kāmandakī (Bib. Ind.).
 Nivandha Saṁgraha—Dallāya.
 • Obstetric Medicine and Surgery—Barnes.
 Operations of General pra ctice—Corner and pinches.
 Operative Surgery—Waring.
 Ophthalmic Surgery—Carter.
 Ophthalmology—Berry.
 Oriental Magazine 1823—Wilson.
 Origin and growth of the Healing Art—Bedroe.
 Osteology—Hoernle.
 Pāṇipī—Goldstucker.
 Pāṇipī—Pāṇipī.
 Paulus Aegineta—Adams.
 Persius.
 Pract.—Haly Abbas.
 Priscianus.
 Principle and Practice of Medicine—Francis.
 Proceedings A. S. B. 1870.
 Rāj Tarāṅginī—Kāhaya (Steen's Ed).
 Rāmāyaṇa—Vālmīki.
 Rasa Ratna Samuccaya—Vāgbhaṭa III.
 Rasendra Cintāmaṇi.
 Recentes Decouvertes—Cordier.

- Records of Buddhist Religion—ITsing (Takakusu's Ed.).
 Rhases.
 Report of Wellcome Research Laboratory, vol. III—Ralfour.
 Researches in Operative Midwifery—Playfair.
 Review of the History of Medicine—Wise.
 Ṛg Veda—Maxmüller and Wilson.
 Rhinoplastic Operations—Keegan Paul.
 Rock Inscriptions of Aśoka.
 Sāṅkara Vijaya.
 Sāṅkhya and Likhita.
 Sanskrit Literature—Macdonell.
 Śārṅgadharma Paddhati—Śārṅgadharma.
 Śārṅgadharma Saṁgraha—Śārṅgadharma.
 Sarva Darśana Saṁgraha—Mādhavācārya.
 Sarvāṅga Sundarī—Arupadatta.
 Śatapatha Brāhmaṇas—S. B. E.
 Science and Art of Surgery—Erichsen.
 Science of Language—Maxmüller.
 Scutonium.
 Siddhāyoga—Vṛndamādhava.
 Soranus.
 Surgery—Billroth.
 Surgical Emergencies—Swaine.
 Sūśruta Saṁhitā—Sūśruta.
 System of Medicine—Albutt and Payne.
 System of Medicine—Daler and Mac Rae.
 Taittiriya Brāhmaṇa.
 Tanjore Catalogue—Barnell.
 Tattva Candrikā—Śivodāsa.
 Things Indian—Art Pinjrapole—Crooke.
 Tibetan System of Anatomy (J. B. A. S.)—Walsh.
 Timæus—Plato.
 Treatment of the Wounded in War—Esmarch.
 Tree and Serpent Worship—Ferguson.
 Upasaka—Śaṅkara Miśra.
 Vāgbhaṭārtha Kaumudī—Śrīkṛṣṇa Senmallik.
 Vāgbhaṭa L'Āstāṅga Hṛdaya Saṁhitā—Cordier.
 Vaidyaka Savda Sindhu—Gupta.
 Vaiśeṣika Darśana.
 Vyākya Kṣumāvalī—Śrīkānta Datta.
 Vedārtha Prakāśa—Sāyaṇa.
 Veterinary Art—White.
 Vienna Oriental Journal, Vol XI.
 Viracintāmaṇi.

- Vṛddha Śarāgadham.
Vṛhadāraṇyaka.
Vṛhat Saṁhitā—Ed. Kern.
Way of Buddha.
Yogaratrikā—Anandāsrama Series.
Zeit. Deut. Morg. Ges. T. LXIX.
-



INDEX.

ENGLISH.

A

	PAGE.
Abdominal binder	181, 188
Abscess	233, 244, 249, 250, 251, 252, 254, 279, 291
Acacia Arabica	360
———catechu	39, 358
Acalypha Indica	360
Acanthobolus	207
Accessory Instruments	91, 94, 97, 175
———Sharp Instruments	282
Accipitar	179
Aconitum heterophyllum	358
Acorus calamus	39, 41
Actual cautery	216, 234
Actuarius	354
Adams	xvi, 18, 146, 166, 169, 170, 201, 210, 217, 221, 224, 232, 258, 336
Ægle marmelos	38, 40, 268, 281, 353, 360
Æsculapius	156, 329, 342
Aetius	166, 169, 207, 217, 228, 230, 266, 336, 346
Agallochum	346, 355
Agate	343
Aggur	355
Agila	355
Ahmedabad	50
Ainsle	331
Akimona	355
Alberuni	vii, 10, 16, 324, 334, 350, 352
Alberuni's India, Edited by Sachau,	viii

	PAGE.
Albucasis 108, 120, 123, 155, 166, 218, 223, 228, 230, 256, 260, 261, 266, 272, 277	
Albutt	329
Alexander	62, 153, 344
Alexander Trallianus	116, 336
Alexandria	340
Alexandrian School	285
Alhagi maurorum	359
Ali Ibn Zain	10
Allium cepa	358
———Sativum	39
Aloes	343
Alpina Galangala	353
Alsaharavius	201
Amber	346, 355
Ambergrise	355
Ambrose Pare	272
Amir Ali	57
Ammonium grani paradisi	353
———elettarium	359
Amputation	231
Analecta Medica	354
Anæsthetics	iii, 59, 60
Anatomy	284, 285, 340
Ancient India	343
Aneylotomus	267
Andreas a Cruce	88
Andrographis Paniculata	360
Andropogon Muricatus	284
———nardus	359
———Schenananthus	41, 359
Angeissus Latifolia	360
Animal Hospital	50
Animism	337
Anthocephalous Kadamba	39, 292

	PAGE.
Antiquity of Hindu Medicine	23, 62, 330, 341
Antiseptic	144, 183
Ants	208, 209
Antyllus	154, 190, 191
—Band of	190
Aod Hindee Agallochum	355
Apolinose	210, 221
Apollo	342
Aquila	355
Arabic Translation of Sanskrit Works	353
Arabic additions in Greek Meteria Medica	353
Arachia Hypogœa	360
Aræteus	80, 116, 146, 154, 254
Archigenes	164
Architecture of the Hindus	89
Areca catechu	354
Arrian, vii.	
Aristolchia Indica	360
Aristophanes	303
Army Surgeon, ii	
Aroma-pipes	85
Arrow	198, 199
—Extraction of	210, 213
Arrow-stem like rods	93
Arsenal de Chirrug	120
Artemesia Indica	353
Artemisia sternutatoria	359
Artery, delegation of	221
Ascites	122, 123, 242, 258
Assafoetida	41
Assyrian medicine	338, 341
Asthma	361
Astringent	221, 222
Astronomy	347, 348
Athens, v.	

	PAGE.
Atomic Theory	333
Atramentum	346
Atrocarpus	268
Anal Probe	219
——Polypus	278
Avenzoar	169
Avicenna	166, 167, 223, 260, 350, 353
Awl	95, 205, 262
Axe	95, 254
Azadirachta Indica	292, 360

B

Babylon	348
Bag	84, 85, 121, 129, 130, 133
——defects of	133
Bagdad	351
Bahram	350
Bairotsana	356
Balance	324
Balanites Rox	37
Baldness	253
Balena Cristata	272
Baliospermum montanum	219
Balsamodendron mukul	41
Bamboo 82, 83, 117, 125, 177, 194, 200, 278, 282, 283, 297, 309, 315, 325	
——forceps	106
——pipe	140
——tube	129
Banc de Hippocrate	89
Bandaging	281
Bandages	94, 176
——Kosa	177

	PAGE.
Bandages Dāma	177
———Svastika	177
———Ānuvellita	177
———Protolī	177
———Mandala	177
———Sthagikā	178
———Yamaka	178
———Khattvā	178
———Cina	178
———Vivāndhana	178
———Vitāna	178
———Gophanā	178
———Pancāṅgi	179
———Mode of application of	179, 180
Banner bandage	178
Banyan Hospital	50
Barber	302
Barks, of trees	94, 177, 189, 193, 195, 283, 284
Bar-Magnet	213
Barmak	351, 352
Barmekides	10
Barnes	181, 202
Barnes' speculum	119
Baron de Saey	349
Barzouyeh	350
Basdeo	350
Basella Rubra	292
BATH :	
———Hot	323
———Ordinary	313
———Medical	313
———Vapour	322
Bathing	313, 314
Bdellium	346, 354
Beal	vii, foot note 48, 299, 308, 317

	PAGE.
Beal's Buddhist Records ... vii, foot note 1, 12, 48, 49, 299, 308, 317	
Bear forceps	96, 102
Bed-pan	38, 317
Bedræ	344, 353
Bell-metal	64, 314, 125, 325
Bellows	328
Bench of Hippocrates	88
Beneras	3, 11, 32
Berberis lycium	359
Berlin	3
Berry	105
Betula Bhojpatra	39
Bhagalpur	16
Bhilsa Topes	319, 327, 346
Bibliotheca Indica, xv	17
Bignonia Snavacolens	310
Binder	188
Binding apparatus	185
Birdwood	344
Bivalve Speculum	119, 120
Bijnor	63
Bladder Sound	125
Blankets	177
Bleeding Lancet	248
Blood-stick	257
Bloomfield	4
Blow	201
Blue-Jay forceps	103
Blunt Instruments	90, 96, 99
————— Discription of	100
———hook	97, 166
———Probe	270
Board	86
Boil,	282 308

	PAGE.
Boil, Treatment of	182
Bone	67, 82, 83, 85, 117
—Lever	172
Boots	308
Borax	354
Botanical Geography	334
Bower Mss.	357
Box for ointments	82
Branch of a tree	94, 210, 295
Brass	123, 125, 300, 326, 328
Bridle ring	210, 211
British Museum	154
Broad Bandage	177
Bronze	82, 83
Brown	337
Brussels	174
Bucher-bird forceps	103
Bud shaped rods	93
Buddha Gurus	344
Buddhist Birth-stories	339
—Missionary	345
—Text Society	357
Buhler	3
Burgess	12
Burnell	5
Butea frondosa	359
—Gunmi	360
Buqrat	346

C

Cælius aurelianus	269
Cæsalpina Sappan	360

	PAGE.
Calopter	118
Calotropis Provera	360
——— Gigantie	360
Cambogia Indica	360
Camper	258, 272
Cancer of the Breast	215
——— Knife...	217, 218
Cane	177, 309
Canopy Bandage	178
Canula	122, 123, 260, 261
Caps	305
Carter	213
Cases of instruments	80
——— ointment sticks	83
Cassia fistula	353
——— obvata	353
——— lanceolata	359
Cataract	273
——— Reclination of	63
——— operation of	273
——— Couching of	273, 274
——— Binder	188
Cat forceps	102
Catheters	137
Caustic	94, 213, 214, 215, 219, 290
——— Thread	175, 270, 271
Cautery	213, 216, 223, 281, 290, 357
Cedrus deodara	219
Celsus	60, 108, 110, 112, 117, 123, 154, 164, 165, 169, 174, 199, 210, 218, 223, 231, 246, 260, 266, 272, 273, 276, 349
Cephalandra Indica	268
Cephalotribe	165
Chaldæ	348

	PAGE.
Chamberlens	167
Chank-Shell	82, 83, 85, 117, 325
Chebulic Myvobolan	37, 41
Chemistry	333
Child's room	40
China root	32
Chinese Medicine	341
Ching-Che-Chun-Ching	341
Chintz	304
Chœnicides	231
Cinnamon	342, 355
Circular shaped instrument	96
——— Bandage	177
——— Cross Bandage	177
——— Chest Bandage	178
Circulation of Blood	332
Cissampelos Pariera	360
Citras medica	354
• Citrus Aurantium	354, 360
Clement	340
Clement of Alexandria	345
Cloth	94, 177, 186, 189, 197, 304, 309, 310, 311, 321
Cloth sieve	320
Clyster	86, 97, 281, 342
——— urethral, rectal, vaginal	281
Cocculus cordifolias	220
Cold application	320
Colebrooke	346
Collection De Chirurgiens Grecs	88
Collyrium Probe	97, 160, 161
——— Pot	324, 325
Comb	303, 304
Continued sutures	209
Convolvulus	353
Cook	48

	PAGE.
Copper	63, 121, 123, 125, 160, 161, 162, 218, 273, 297, 300, 301, 314, 316, 325, 328
———Probe	272, 275
Coral	66, 325
Cordier	12, 24, 27
Corner	261
Cos	347
Coscinum fenestratum	360
Cotton	177
Craniotomy	239
Creepers	94, 196
Crescent shaped cautery	172
Cripple	196
Crocodile	99
———forceps	102
Crooke	50
Crotalaria juncea	219
Crotchet	166, 195
Crow forceps	96, 103
Cruciform Instruments	91, 92, 100
Crystal	282, 286, 310, 316, 325
Csoma de Koros	356
Cucumis Sativus	280
———Colocynthis	359
———Utileissimus	280
Cucurbita Pepo	39
Cucurbitula	342
Cullen	337
Cupping	148, 149, 150, 152
———bow	386
———Instrument	97
Cunningham	30, 50, 319, 327, 346
Cureuma Longa	291, 292
Cureton	353
Ourlew forceps	103

Cythescomele,	158 160
---------------------	---------

D

Daimacus	344
Dallvāṇa's Commentary	12, 17, 57, 87
Dandruff	303
Dandy	356
Dar A tharvaveda	3
Dareheeni	355
Darsheeni	355
Davam Non-gah	356
Dawn of Civilization	341
Dead Fœtus ; Extraction of	165
Decapitating hook	225
De Medicio	37
De Med. Ægyptiorum	153
Deedara	354
Deindar	354
Delivery hook	97
Dengue	356
Depilation	303
Deodara	354
Deer forceps	96, 102
Dhatura alba	359
DHN	352
Diagnosis	202
Diary	36
Diaz	347
Dietz	345, 352, 353
Dilators	123, 125
———-urethral	123, 125

	PAGE.
Dilators, Rectal	124, 125
Diodorus Seculus	343
Dionysos	345
Dioptr	113, 120, 342
Diospyros Embryopteris	39
Dioscorides	59, 346
Director	173, 174
Description of Hindusthan	50
Disinfection of rooms	147
Dislocation	194
———of the neck	194
———lower jaw	201
Dispensaries, vii	34, 49, 57
Dissection	283
Dissection forceps	266
Distillation	334
Diudar	353
Division	280
Dolichos lebleb.	354
Dolichos Biflorus	37
———Uniflorus	39
Domitan	303
Door-bed	87
Double nose-spoon	85
———bag	85
———bandage	178
———edged knife	244
Dress	304, 305
Dressing forceps	106
Drinking Vessel	314
Dropper	327
Dropsy, 257	260
Dublin	195
Dung	216
Dunglison	179

E

Eagle Forceps	105, 202
Early History of India	6, 35, 49
Earth	312, 314, 316, 326, 328
Earth-worm like rod	93, 97
Earthen Ware	312
Ear scoop	107, 164
—Specillum	158, 164
—cleaner	163
—Perforator	263
Ebers Papyrus	340
Ebony	342, 343, 344, 346, 355
Edge	61, 69, 73
Edict of Asoka	47
Edinburg Medical Essays	240
Egypt	153, 344
Egyptian women	303
—Medicine	338
—Physicians	340
Electro-magnet	213
Elettarium Cardamomum	39
Elephantopus Scaber	291
Elphinstone, xiv	334, 361
Embelic Ribes	39, 360
Embryotome	230
Empyæma	241
Encircling bandage	177
Enfield	348
Enterocœle	246
Epilation	105, 202
Erasistratos	285
Erichsen	106, 110, 149, 201, 213, 245
E. Robusta	360
Evacuation	281

	PAGE.
Excision	256, 266, 280
Execution	68
Extant Works of <i>Ætius</i> xv	
Extraction	281
———of foreign bodies from throat	109, 197 201
———from ear ...	199
———from eyes and teeth ...	213
———of thorn	205
———of bone	203, 210
———of fish bone from throat	206, 297
———dead fœtus	165, 226
———needles	238
———soft structures	244
Extraction of stones from Urethra	265
———tartar from teeth	268
Ezion-Gaber	344

F

Fa Hian	49, 317
Falcon Forceps	103
Fan	308
Fauſil	354
Fear	98, 212
Female catheter	137
Fergusson	159, 255, 324
Ferrula Assaſetida	39
Field-hook	181
———surgery	332
Ficus Bengalensis	220, 292
———Religiosa	292
Fihrist	9, 351
File	269
Fillet	167, 190

	PAGE.
Filfil	355
Filters	309, 319
Finger	83, 94, 161, 199, 200, 208, 291
———-Knife	34, 94, 238
———-guard	97 118
Firañga roga	28, 32
Fire	94, 290
Firroz Shaha	352
Fish-hook	93, 95, 264
Fish-bone, Extraction of	206
———-forceps	207
Fissorius	256
Fistula-in-ano	271
Five-faced instrument	96
Five tailed bandage	179
Flax	210, 221
Fleam	256, 257
Fleet	6
Flower of Barley and Wheat	219
Fluxing	94, 212
Flügel	352
Fly-Brush	308
Fœtus-Hook	165
Forceps	92, 167
Fork-tailed forceps	103
Foreign origin of Hindu Medicine	348
Foot, sole of	94, 199, 200, 202
Foubert	272
Four-tailed bandage	178
Fracture-bed	86, 87, 88, 89
Fracture of nasal bone	117
———-the lower extremity	193
———-and dislocations	195
———-of carpal and metatarsal bones	198
France	303

	PAGE.
Francis	335
Fufal	355
Funis	282
Fumigation	63, 144

G

Galanga	355
Galangal	353
Galen	x, 60, 164, 171, 191, 218, 223, 231, 232, 269, 330
Galzlaß	341
Gangrene	231
Gastroraphe	221
Gamma shaped cautery	160
Gauze	182
Genuine Works of Hippocrates	xvi, 88, 113, 169, 174, 108
Ghoom Monastery	357
Gingivitis	291
Giudo-de-Cauliaco	272
Glands	200, 236
Glass	125, 140, 282, 286, 316
Gloriosa Superba	39
Gmelina Arborea	292
Goad-like rods	93
Gold	64, 65, 66, 82, 83, 84, 117, 125, 135, 160, 161 177, 218, 273, 278, 299, 312, 314, 316, 325, 326.
———Probe	218, 219
Goldstucker	1
Gossypium Herbaceum	360
Gouge	199
Gourd	109, 150, 342
Granular lids	293
Greece	349

	PAGE.
Greeco-Roman Surgical Instruments	xvi, 146, 147, 153, 163, 167, 174, 199, 228, 230, 240, 246, 313.
Grewia Asiatica	37
Griffith	3
Grind stone	327
Gum-boil	242
Gunshot Injuries	200
Gut	98, 220, 221, 222
Gynocardia odorata	360

H

Hahneman	338
Hair	94, 205, 206, 234, 304
Half-moon	96, 97
———probe	171
Half-moon Scissor	251
———Knife	251
Haly Abbas	120, 166, 219, 230, 260
Hammer	94, 96, 111, 198, 199, 256, 328
Hamilton	56, 195
Hand	90, 199, 200, 203
——Palm of	94, 321
Happiness	212
Hammurabi	339
———Laws of	339
Harp-string	221
Hartal	355
Harun-Al-Rasid	29, 351, 352
Haas	347
Hawk	103
Head dress	305
Headache	344

	PAGE.
Herculaneum	v
Hermetic Books	340
Hero	153
Heron forceps	96, 101, 103
Herodotus	191
Herophilus	269, 285
Hesepti	340
Hessler	17, 91, 104
Heyne	57, 326, 331
Hipparchus	348
Hippocrates	37, 88, 113, 123, 146, 159, 165, 169, 170, 173, 180, 210, 216, 217, 218, 221, 232, 239, 241, 258, 271, 272, 303, 347, 349.
Hipocratic oath	169, 345
Hipocratists	284, 285
Hindu system of Medicine	xv
Hiram	344
Hirschberg	361
Hist. De. la medicine	232
Historia Forcepum-et-vecticun	166
Historian's, History of the World	340, 348
History of Aryan Medical Science	xv. 23, 29, 316
History of Hindu Chemistry xv	6, 24, 28, 290
History of Indian Literature	346
History of philosophy	548
History of Medicine	209, 285, 286, 331, 347, 361
History of the Saraceens	57
Huuen Tsiang	47, 299, 308
Hærnle	5, 15, 16, 17, 19, 20, 21, 22, 24, 29, 204, 214, 216, 243, 251, 284, 331, 232.
Hæmorrhage	221
—————arrest of	221, 222, 223, 324
Hoffman	337
Hook	70, 96, 106, 165, 227, 229, 264, 266, 342
————Lithotomy	97

	PAGE.
Hook, Delivery	97
—— Blunt	91
Hollow Instruments	91
—— Cylinder Bandage	177
Horace	348
Hordeum Vulgare	37, 41, 265
Homer	221, 340
Horn	66, 67, 82, 83, 96, 97, 109, 117, 119, 125, 148, 154, 161, 205, 325, 342.
Horse-hair	205, 208, 210
—— Probang	207
Horse's Bridle	94, 210
Hospices	48
Hospitals	iv. vii, 8, 34
—— requisities	295
—— Merit of erecting	51, 52, 53, 54, 55
House of mercy	49
Hot Application	320
• ——— Bath	323
Humoral Pathology	353
Huth George	23
Hyena forceps	102
Hydrocele	123, 205, 218, 242, 259, 261
Hydrophobia	342
Hydroctyle Asiatica	39
Hygienic appliances	295
Hygrophila spinosa	360
Hypodermic medication	235
—— Syringe	235
Hwangati	341

I

Iatrum	37
--------	----

	PAGE.
Ibn Abillsaibial	18
Iguana faced instrument	95
Imhotpu	341
Impellent	111
Impomea Haderacea	360
Impoca Turpethum	360
India in Greece	344
Indian Medicine	29
Indian Antiquary	6
Indian Antiquities	162
Indian Tracts	326
Indian Nelumbium	345
Indian Physicians in foreign court	351
Indian drugs in Greek Meteria Medica	353
Indian Rhubarb	354
Indigo	346
Indica	vii, 344
Indo-Aryan	62, 196, 304, 305, 308
Industrial arts of India	344
Inflammation	219
Instruments, Uses of	74
—————Good and bad qualities of	73, 74
Interrupted suture	209
Intestinal obstruction, Operation for	209
Introduction	1
Iron	61, 91, 123, 160, 162, 177, 213, 218, 273, 278, 297, 315, 325, 326, 328.
I' Tsing	19, 20, 21, 22, 23, 24, 297, 303, 312, 313, 317, 358.
Italy	303
Itch-cloth	182
Ivory	67, 82, 83, 117, 125, 204, 325, 343, 344.

J

Journal American Oriental Society	34
-----------------------------------	----

	PAGE.
Jackal forceps	102
Jacobi	195
Jewet	195
Jolly	19, 21, 22, 29, 331
Jones, Sir William	192, 193, 329
Journal Asiatic Society of Bengal	6, 23, 30
Journal Royal Asiatic Society	6, 15, 19, 22
Joy	212
Jury mast	194
Justicia adhatoda	359
Jute	189
Juvenal	303

K

Kaimonis	355
Kali	355
Kalila and Dimna, Fables of	351
Karaka	9
Kashmir	3, 5
Kassiteros	355
Katindion	254
Kern	348, 351
Khrisrong Dehutsan	356
Khoraba	355
Kih Futo	308
Kitchen	43
———Superintendent	43
Kitab-Shawshoon-al-Hindu	17
Kitab-i-Susrud	18
Kite Forceps	103
Knife-Shaped saws	231
———double edged	249
———Gold	278

	PAGE.
Knife-Silver	278
—— Iron	278
—— blades	177
Koningsberg	347
Kordofan	150, 217
Koshta	355
Koosrus	355
Kootha	355
Ktesios	344, 345, 349
Kust	355

L

L' Historia du Budh Ind	12
Lac	82, 83, 117, 123
Lama Śes-raké MGya Mtsho	357
Lanman	3
Lancet	260, 357
—— Double-edged	242
—— Straight	242
Lapis-Lazuli	314, 316, 325 354
Lhasa	357
Lead	63, 122, 123, 125, 160, 177, 218, 300
Leather	94, 177, 184, 185, 189
—— Bandage	184
—— Ligature	185
—— Shackle	185
—— Binder	188
—— Bags	188
—— Bag for the head	188
—— Band	189
—— Bottles, jar	191, 193
—— Belt	193
—— Shoe	307

	PAGE.
Leaves ...	253, 291, 292, 309, 315, 316
Lee ...	343
Leech ...	247, 282, 286, 350
——— Poisonous ...	287
——— Non-Poisonous ...	287, 288
——— Application of ...	288
——— Bite of ...	289
Leeds ...	213
Lemon ...	354
Lenticular ...	199
Leprous spot ...	247
Life of Atisa ...	30
Ligature ...	176, 205, 220, 223, 245
Linen ...	315
Linum usitatissimum ...	39, 359
Linseeds ...	41, 219
Lint ...	220, 321
Lion ...	101
——— Forceps ...	96, 101, 102
Liston ...	245
Lithotomy operation ...	86
——— Straps ...	185, 187
——— hook ...	97
——— Scoop ...	169
——— forceps ...	169
——— binder ...	342
——— crutch ...	187
Littlewood ...	213
Littre ...	88, 89, 169
Living fetus, Extraction of ...	167
Loadstone ...	94
Longmore ...	200
Long-mouthed-knife ...	233, 240
Lonsdale ...	343
Looking glass ...	304

	PAGE.
Louse	304
Luffa amara	359
Lucknow, Royal Library of	352
Lunatic	279
Lying-in-Room	38

M

MacCrindle	343
Macdonell	3, 81, 303, 330
Mace	353
Machaon	342
Macis	353
Magnet	212, 213, 333
Maison Dieu of Paris	49
Malabathrum	354
Malatroon	354
Mallet	199
Mallotus Philippiensis	359
Mandragora	60
Manetho	340
Mansil	355
Marsden	215
Marshall	213
Masern	356
Maspero	341
Massage	35, 333
Mussel-shell	326
Materia Medica of the Hindus	XV, 25
Maximüller	10, 352
McClintock	167
Macrae	329
Measles	356
Measures	324
Medical bath	313

	PAGE.
Medicina Aegyptiorum ...	303
Medicine ...	94, 219
Medicine glass ...	326
Medullary canal ...	263
Megasthenes, ...	xiii, 35, 343, 345
Melia Azadirachta ...	354
Memphis ...	340
Mesue ...	277, 354
Mesua Ferrea ...	310
Metal plates ...	177
Michelia Champaka ...	310
Midwifery Forceps ...	166
Milne xvi, 120, 137, 144, 153, 163, 167, 199, 228, 246, 303.	
Misy ...	355
Modioli ...	231
Mohamayuri Vidya-rajui ...	358
Moringa peterygosperma ...	219
Mortar ...	318, 319, 327
Moschos Moschifera ...	354
Mouth ...	94, 205, 264
Mulder ...	166
Muller ...	36, 68, 327
Musa Paradisiaca ...	354
Musée de Cinquantenaire ...	174
Mustard seed ...	39, 41, 219
Mylabris Phalerta	361
Myrica Sapida ...	359
Myrobalani ...	354
Myzon ...	266

N

Nævus ...	245
— Needle ...	245, 246
Nail ...	94, 204, 201

	PAGE.
Nail-parer	94, 237
—-shaped cauteries... ..	159
—-shaped rod	98, 159
Nalanda	19
Nala reed	82, 83, 117
Naples Museum	V, 113, 120, 137, 154, 158
Nardostachys Jatamansi	41
Nasal-insufflator	116
— polypus	252, 254, 278
— -Speculum	115
Natural History	60
Naubehar	351
Navel cord	278
Nearchus	62, 344
Needle	94, 96, 99, 210, 243, 253, 262, 342
— Curved	245
— Cautery of gold	66
— Four-ribbed	246
— Golden	65
— Half-curved	245
— Round	246
— Straight	245
— Three-cornered	246
— -shaped Probe	271
Neiching	341
Nerium Odorum	219
Neuburger	209, 285, 286, 331, 339, 340, 347, 361
Neugebauer's speculum	119
New-born	202
Nooshirwan	349
Nose-spoon	84
Number of Surgical Instruments	90
Nurse	45, 202
Nutmeg	353
Nux moschata	353

	PAGE.
Nux Vomica	354, 361
Nyctanthes Arbor-tristis	291
Nymphæ Lotus	292
——— Stellata	310

O

Obstetric Medicine and Surgery	181, 202
Ocimum Basilicum	39
Odyssey	221
Officina chirurgical venetiis	88
Ointment box	84
——— pots	82
——— sticks	83, 84
Olivary probe	219
Onyx	342, 346
Opening	281
Operations	6, 8, 15, 24, 74, 76, 77, 78
Operations of General Practice	261
Operation-table	85
Operative Surgery	245
Ophelia augustifolia	359
Ophelia chiretta	359
Ophir	344
Ophthalmia	344
Ophthalmic Surgery	213
Opium	28, 33
Orange	354
Oríbasius	116, 147, 154, 191, 217
Origin and Growth of the Healing Art	344
Ornamentation	69
Osler	329

	PAGE.
Osprey forceps	103
Osteology, Hoernle	5, 15, 16, 19
——— of the Hindus	xv, 241, 284
Owl forceps	103

P

Palm	199, 200
Panchanadapura	5
Panicum Dactylon	41
Panther forceps	102
Pao-d'aglia	355
Paracelsus	337
Paracentesis abdominis	97, 242, 257, 260
Parulis	242
Pasha, Sir R.	150
Pātaliputra	49
Patient, good qualities of	45
Paulus Aegineta	18, xvi, 105, 108, 110, 111, 112, 113, 117, 118, 120, 123, 149, 154, 159, 160, 163, 166, 170, 171, 172, 173, 187, 191, 199, 201, 205, 207, 217, 218, 219, 221, 223, 224, 228, 231, 232, 238, 242, 246, 354, 258, 260, 261, 266, 271, 277, 293, 336, 342, 346, 348, 349
Payne	i
Peacock's feather	309
Pearl	310, 354
Pebble	94, 197
Pehlevi	349
Persia	349
Persius	303
Pestles	68, 172, 173, 318, 319, 327
Phaseolus mungo	37

	PAGE.
Phaseolous Rox	37, 189
Philadelphous	345
Phlebotome	280, 241, 242
Phlebotomy	86, 186, 189, 190, 241, 259, 264
Phoska	356
Phyllanthus Emblica,	37
Physician, Qualities of a	52, 58
Picklock	91, 93, 106
Picrorhiza Kurroa	260
Pila	319
Piles	86, 205, 293
Pilum	319
Pilpay, Fables of	349
Pilpil	355
Pimpinella Anisum	359
Pincher	91, 92, 95, 103, 105, 234, 328
Pinches	261
Piñjrapoles	50
Pinus	354
Pinus Deodara	39, 353
— longifolia	219
Piper	355
— betel	354, 360
— cava	39
— cubeba...	353
— Longum	39
Pippul	355
Placenta	203
— Removal of	203, 208
Plantago Ovata	360
Plantain	354
Plato	146, 341
Playfair	167, 209, 331
Plinthium Nilefi	88, 89, 342
Pliny	60

	PAGE.
Plumbago Zeylanicum	39, 219
Plums	37
Plum-seed-like rod	93
Poeea	356
Poeke	356
Poecke	344
Podalarius	342
Poison, Works on	351, 352
Poison extraction of	198
—— Stone	198
Polish	62
Polypus-scalpel	230, 278
Pompeii	V
Pomum somniferum	60
Pongamia glabra	39, 219, 359
Porcelain	312
Portable cases	80, 81, 82
Porus	62
Postural treatment	333
Potential cautery	213, 214
Potsherd	321
Poultice	219, 323
Practical Ophthalmology	105
Pricker	91, 155
Prickly tongue	229
Prinsep	162
Priscianus	157
Probang	207
Probe	95, 96, 99, 173, 215, 316, 235, 293
—— Aural	219
—— Blunt	270
—— Collyrium	160
—— Copper	272, 275
—— Gold	218, 219
—— Half-moon	171

	PAGE.
Probe Hard	293
— Jāmvoyaṣṭha	159
— Nail-shaped	159
— Needle-shaped	271
— Olivary	219
— Sarapunkha-mukha	171
— Sharp	269, 370
— Snake's hood	168
— Soft	293
— Spoon-shaped	158, 215
— Swab	157
— Urethral	174
Probing	281
Prosper Alpinus	153, 303
Pterygium	116, 205, 226, 227, 228, 265, 266
Pterygotomes	228
Ptolemy	344, 345, 348
Ptychotis ajowan	359
Punjab	5
Punyaśālās	vii, 48
Pupal	355
Pus basin	317
Puschmann	353
Pythagoras	344, 345, 348

Q

Quadrivalve speculum	120
----------------------	-----

R

Raisins	37
Rāmāyana	16
Ramosbotham	225
Ranula	229
Raphanus sativus	229

	PAGE.
Rasendra Cintāmaṇi	67
Raspatoty	269
Rattan	264
Razor	81, 94, 155, 233, 234, 235, 236, 300, 301
Recentes Decouvertes	12
Records of Buddhist Practices	19
Records of Buddhist Religion	297
Rectal clyster	125
——— injections	125
——— speculum	113
Reinaud	352
Relation of Hindu and Arabic medicine	350
——— of Hindu and Greek medicine	343, 347
——— of Sanskrit and Persian medical works	349
Researches on Operative Midwifery	167
Rest-house	48
Retz	130
Review of the History of Medicine	330
Rgyud Bzhi	356
Rhabarburnum	354
Rhazes	9, 18, 23, 123, 166, 219, 221, 229, 260, 261, 277, 290, 350.
Rheims	163
Rhinoplastic operation	118
Rhys David	339
Ricinus communis	291, 359
Ring knife	240, 342
——— Scalpel	239
Rods	80, 91, 93, 97, 155, 215
Rogerius	272
Rolleston	329
Rope	177
Roth	3
Round headed knife	94, 225
Royle,	xv, 23, 62, 330, 331, 341, 347, 352, 353, 354

	PAGE.
Rubia Cordifoliatum	130
Ruby	282, 286
Rufus	342
Ryder	35

S

Saccharam Muuja	283
Sachau,	10,324,350,351,353
Sacred Bean	345
Sacred Books of the East	4,11,13
Sadej	354
Sahabuddin	269
Sais	341
Saju	355
Sajjumattee	355
Sajiloon	355
Sajimen	355
Sakhya	356
Sakkara	355
Salvinia cucullata	359
Sand	321
Sandals	308
Sanskrit Literature	3,81,303,330
Santal	355
——— Album	359
——— Flavum	359
——— Rubrum	355
Saraca Indica	41
Sarad	350
Saradaprasad Banerjee	357
Saratchandra Das	357
Sarcostemma brevistigma	220
Satapatha Brahmana	15

	PAGE.
Saunaka School	3
Saussurea Lappa	39
Saw	73,94,96,230,231,342
Sayce	341
Sayre	194
Scales	324
Scammum Hippocratis	88,342
Scarac	350
Scarificator	238
Scarifying	253,254,256,279,281,291
Schultet	120
Sciatica	236
Science and Art of Surgery	106,110,149,201,213,245
Science of Language	10,353
Scindaspus Officinalis	39
Scirac	350
Scissors	234,249,250
—— Half-moon faced	251
Scoop	278
Scottish National Museum	154
Scraping	300
Scratching	258,293
Scrivonius Largus	158
Scrotal tumour	234,362
Sebaceous Cysts	242
Sel	354
Semecarpus Anacardium	39
Senti	340
Senna	353
Senta	340
Serapion	9,260,350,354
Sesame	37, 219
Sesamum Indicum	37, 361
Seutonium	303
Sewing	281

				PAGE.
Shampooers	...	...	...	85
Shandana	...	...	...	355
Sharp Hook	...	...	...	264,266
— Instruments	...	...	...	90,94,98,225
— Mode of holding	...	...	...	279
— Probe	...	...	...	269
Shaving	...	...	...	300,303
Shells of fruit	...	...	...	82,117
Shimgveez	...	...	...	355
Shoes	...	...	...	306,307
— Leather	...	...	...	307
— Wooden	...	...	...	307
Shorea Robusta	...	...	...	359
Short-mouthed knife	...	...	...	233,240
Shoulder, Dislocation of	...	...	...	173
— strap	...	...	...	84,85
Sieves	...	...	...	319
Silk	...	...	...	98,177,304
Silver	...	64,65,66,82,83,84,117,123,125,160,161, 278,299,312,314,315,325,326,328	...	
Simnoi	...	...	...	345
Simpson	...	...	...	239
Sindaxar	...	...	...	23
Sindh	...	...	...	25
Single-edged Knife	...	...	...	94,243
Sinus	...	...	...	270,298,294
Skins	...	...	...	192
Sling Bandage	...	...	...	173
Smellie,	...	...	...	167
Smoking	...	...	...	143,144
Snake-bite	...	...	150,185,199,237,344	
— charmers	...	...	...	198
— Works on	...	...	...	351
— hood like Rods	...	...	...	93,97,168
Snell	...	...	...	213

	PAGE.
Soda	355
Sodepore	50
Solanum Nigrum	292
Solomon	344
Solon	341
Soma	66, 68
Soranus	120, 147, 166, 229
Sorrow	212
Soza	355
Spathomele	157, 158
Spatula Probe	157
Speillum	163, 269, 272
———— Rectal	97
———— Vaginal	97
Spittle	94, 211
Spittoons	36, 317
Splints	193, 195, 196, 283
Spongio Somnifera	60
Spoon	317, 328
—— gold	16, 65, 92
—— shaped knife	168
—— shaped Probe	158, 160, 215
Sprengel	232
St. Andrews	239
Stahl, George Ernest	337
Staphyloma	246
Steel	61, 161
—— yard	324
Stein	24
Stems	293
St. Germain-en-Laye	163
Sticks	306
Still-born	198, 308
Stone	68, 94, 128, 160, 162, 197, 198, 310, 316, 325, 327
—— Extraction of	168

	PAGE.
Stool, Operation—	86
Strabo	xiv 343, 344
Strainer	312, 319
Stricture dilators	125
Strychnos Nux Vomica	359
——— Potatorum	359
Studies in the Medicine of Ancient India	5
Styptics	223
Substitutes for cutting instruments	282
Sucking-horn	357
Suction	149
——— Apparatus	204
Sugar	204, 355
Sukkur	355
Sulphuret of Arsenic	355
Sundul	355
Supporter Bandage	178
Suppuration	98, 262
Suqrat	347
Surat	50
Surgical Emergencies	207
——— Instruments	14
——— Operations...	14
——— operations, practical training of	280
Suspension Apparatus	194
Suture	205, 243
——— Sling-like	209
——— varieties of	209
——— Material	208
Swabs	93
——— Probes	157
Swain	207
Sweet cane of Scripture	346
Sword-shaped cautery	218

	PAGE.
Sylvain	6
Sylvius	337
Symon Set	346
Syphilis	32
System of Medicine	329

T

Tabosheer	354
Tail-Bandage	177
Takakusu	19
Tamar Hind	356
Tamarinds	356
Tamarindus Indica	354
Tambapani	47
Tamuarin	356
Tangore Catalogue	5
Tanjur	23
Tapping	281
Tārakeśvar	ix
Tashi Lama	357
Tatanagum	355
Tectonia Grandis	291
Tembul	354
Tempering	70
Temple-Sleep	ix
Tenaculum	266
Tendrils	177, 189
Tents	117, 175, 181, 220, 322
Terminalia Bellerica	37
————— Chebula	130, 361
Teta	340
The Authorship of Caraka Saṁhita	5
The Invasion of Alexander the Great	xiv

	PAGE.
Theodoric	60
Theophrastus	343
Things Indian	50
Thomas	162
Thot	340
Thread	94, 175
Three faced	95
Throat Speculum	96, 109
Thucydides	vi
Tibet	356
Tibetan Block Prints	357
——— Surgical Instruments	356
Tiger Forceps	102
Tiger's Claws	99
Timæus	341
Time	98
Tin	... 63, 122, 343
Tineal	355
Tinkar	355
Tinospora Cordifolia	359
Tob Chini	32
Tongue	94, 203
——— Scraper	299, 300
Tonsil	254, 265, 266
——— Operation of	226
Tooth	... 94, 216, 268
——— False	269
——— Loose	268, 294
——— Wisdom	268
——— Ache	299
——— Brush	207, 295, 296, 299
——— Cleaner	298
——— Elevator	170
——— Extraction	171, 268, 269
——— Extractor	97

	PAGE.
Tooth Pick	95, 297, 299
—— Powder	295
—— scaler	40, 204, 267
—— wood	297
Tootum	355
Toryne	254
Tosorthros	340
Toy Cart	35
Traction Hook	165
Transactions of the Royal Asiatic Society	346
Treatise on Midwifery	167
Tree and Serpent Worship	159, 235, 324
Trepan	232
Trephine	231, 232
Trichiasis,	66, 105, 218, 228, 246
Trifolia	354
Trivalve Speculum	120
Trocar	261
Tryphala parva	354
Tryphalla	354
Tsac-urh	298
Tsang-urh	298
Tube	121, 122, 129, 131, 132
—— Defects of	133, 134
Tubular Instruments	91, 93, 96, 108
—— for Ascites	122
—— of Cupping	148
—— for Fistula-in-Ano.	114
—— for Fumigations	140
—— for Hydrocele	123
—— for Inhalations	140
—— for Injections in the	
Rectum	125
—— for Inspection of Arrows	111
—— for Nose	115

	PAGE.
Tabular Instruments for Piles	112
————— for Rectal Stricture	124
————— for Urethra	135
————— for Urethral Stricture	123
————— for Uterus	138
————— for Vagina	138
————— for Wounds	121
Tuj	354
Tumbol	355
Tunbol	355
Turbans	305
Turpeth	354
Turtullian	240
Tutenagum	355
Tutia	355
Tutthy	355
Twine	94, 176
Typha	254

U

Umbrellas	306
Urethral Probe	136, 174
———— Syringe	138
———— Tubes	135
Urginea Indica,	361
———— Jambolana	38
Urinal	36, 317
Uterine Clysters	138
———— Medication,	139
———— Tube	135, 138, 139
Uvula	265

V

Vagbhata et L'Astangahrdaya Samhita	24, 27
-------------------------------------	--------

	PAGE.
Vaginal Clyster	138
Vaginal Speculum	97, 110, 120, 342
—— Tubes	135, 138
Valeriana Hardwicki	360
Vānumati	17, 31
Vapour-bath	68, 182, 322
Variola	356
Vessels, Puncturing of	255, 264
Vasti-yantra	36, 67, 86
Vata-Rakta	9
Vegetius	260
Velpeau	215
Venesection	256
Verole	356
Veterinary Art	257, 351, 352
Virgil	343
Visa-Vaidya	111, 45
Vitis Vinifera	37
Vpddha Trayi	19, 21
Vallurs	17
Vulsellum	266
Vulture Forceps	103

W

Walsh	356
Waring	245
Warts	242
Watanbe	357
Water, cooling of	311
Water, Impure	312
—— Purification of	310

			PAGE.
Water, Scented	...	...	314
—— Seasonable	...	...	313
—— Touched	...	...	312, 313
—— dipper	...	...	312
—— Vessel	...	...	312
—— Vessel, Stand for	...	...	311
Way of Buddha	...	...	309, 312
Weber	...	...	346, 348, 353
Weighting Scales	...	...	36
Weights	...	...	324
Wellcome Research Laboratory, Report of	...	...	150, 217
Wheat	...	...	219
Whetstones	...	...	36, 80
Whisker	...	...	307
White	...	...	257
Whitney	...	...	3, 137
Willi	...	...	337
Wilson,	...	V, 10, 64, 320, 331, 353	
Winding suture	...	...	209
Wine	...	...	59
Wise	...	XV, 254, 330, 347	
Withania Somnifera	...	...	220
Wolf Forceps	...	...	102
Woman-milk	...	...	275
Wood	...	68, 82, 83, 117, 123, 125, 140, 177, 397, 300, 307, 315, 316, 328	
Wooden Hand	...	...	196
—— Splints	...	...	196
Woollen Threads	...	...	210
Wounds	...	...	291, 292
—— Fumigation	...	...	97, 122, 144
—— Syringe	...	...	99, 121, 281
Wrightia Antidysenterica	...	...	360
Wustendeld	...	...	353
Wuz	...	...	355

X

Xarac	350, 354
-------	-----	-----	-----	-----	----------

Y

Yolk's Tail	309
-------------	-----	-----	-----	-----	-----

Z

Zanik	...	...	...	...	352
Zarnach	...	...	...	...	355
Zeit. deut	...	...	...	...	23
Zingiber	...	...	...	...	355
Zinzabill	...	...	...	...	355
Zizyphus Jujube	...	...	...	...	37
Zoology	...	...	...	...	334

INDEX.

SANSKRIT.

A

PAGE.

Abāñmukha	...	...	99
Abhayā	...	...	37
Abnus	...	...	355
A. Caṭṭopādhyāy	...	...	17
A. C. Kaviratna	...	...	9, 17
Ācūṣaṇa	...	...	75, 76
Adhamulla	...	...	32
Adhijihvā	...	...	229
Adhyarddhadhāra	...	...	98, 243
Agada	...	...	2
Agastya	...	...	51, 192
Agni	...	...	94, 215
Agnidamani	...	...	359
Agnika	...	...	219
Agniveśa	...	...	4, 7, 22, 25, 26
Agniveśatantra	...	...	130
Agra-bakra	...	...	168
Aguru	...	...	355
Āharaṇa	...	...	75, 76, 77
Airvārūkamukha	...	...	92, 103
Ajakarṇa	...	...	359
Ajamoda	...	...	359
Ākāśa-gotta	...	...	xi
Alābu	...	...	97
Alābu-Yantra	...	...	150, 342
Alagarddā	...	...	288

	PAGE.
Amarāvati	306
Ambara	355
Ambashthai	360
Āmlakī	37
Amoghavajra	358
Amṛta	220
Anaka	96
Āncana	75
Āṅguli	94, 199
———Śāstra	98, 238, 342
———Yantra	342
Āṅkuśa	165, 328, 342
———Cautery	160
———vadana	93
Antarmukha	78, 95, 98, 250, 251
Antarvalkala	193
Antiochus	47
Anuśāstra	282
Anuvellita	177
Anuyāntra	98
Ārā	95, 98, 205, 262, 263, 279
Archæological Survey of South India	12, 30
Arddhacandra	96, 99, 251
———mukha Śālā	171
Arddhacandrānana	98, 251
Arddhadhāra	77, 94, 243
Arddhendu	98
Arhats	345
Arjuna	292
Arka	360
Arkamūla	360
Arunadatta	24, 27, 237
Aśadhara Sallaxana	28
Āsava	39
Aśmabhālam	318

	PAGE.
Aśmarī	97
Aśoka	... iv, 8, 34, 41, 47, 49, 345
Aṣṭāṅga Hṛdaya Saṁhitā	18, 19, 23, 25, 26, 67, 69, 73, 76, 79, 81, 86, 88, 92, 98, 101, 104, 105, 107, 108, 109, 110, 111, 112, 113, 114, 115, 117, 118, 119, 121, 122, 127, 136, 143, 143, 148, 151, 156, 157, 159, 160, 163, 165, 168, 175, 186, 187, 189, 190, 195, 197, 198, 199, 200, 201, 203, 204, 206, 208, 211, 214, 217, 222, 225, 230, 232, 237, 239, 240, 244, 247, 250, 251, 253, 255, 256, 257, 258, 259, 262, 264, 265, 267, 270, 271, 272, 276, 278, 280, 290, 333
Aṣṭāṅga Hṛdayatikā	28
Aṣṭāṅga Saṁgraha	18, 23, 24
Aṣṭhīlāśma	94, 197
Asutosh Mookerjee, Hon'ble Justice Sir	xvi
Āśvabala	292
Āśvagandhā	220
Āśvakaṭaka	94, 210
Asvavaidyaka	114, 130, 158, 235, 241, 242, 258, 266, 316, 334
Āśvins	4, 12, 341
Ātarusha	359
Ātasi	39, 359
Atharva Veda	1, 3, 15, 39, 61, 137, 303, 304
Ātī	249
Ātīmukha	78, 95, 249
Ātīvadana	98
Ātīvisha	358
Ātreya, Punarvasu	4, 15, 18, 21, 130
Atri	353
Aupadhenava	17
Aurabhra	17
Avabhanjanamukha	92, 103
Avanti	308
Ayaskānta	94, 212
Āyurveda	1, 13, 22, 342
Āyurvedārthadīpikā	7

B

Bael Fruit	...	...	...	281
Baṇṣabidala	...	...	...	106
Bakam	...	...	...	360
Bandhana	...	...	...	74, 76
Baptista	...	...	...	60
Barley	...	...	...	41
Behicharlal Nathuram	...	...	...	27
Bhāba Prakāśa	32, 33, 99, 128, 138, 194, 195, 200, 296, 300,			
	301, 304, 305, 306, 307, 308, 312, 313, 316, 323, 325, 332			
Bhāgavat	...	...	...	16
Bhāllātaka	...	...	...	39
Bhāṇḍarkar	...	...	...	6
Bhaṅga	...	...	...	76
Bhañjana	...	...	...	75
Bhānumati	...	...	...	107
Bhāradvāja	...	...	...	4
Bhāsamukha	...	...	...	92
Bhāsamukha Forceps	...	...	...	103
Bhāskara	...	...	...	17
Bhāvamiśra v, xiv	22, 99, 128, 193, 194, 195, 200, 295, 299,			
	300, 301, 304, 305, 306, 307, 308, 312, 313, 323, 324			
Bhedana	...	...	...	77, 80
Bhela	...	...	...	4, 5, 25
Bheṣaja	...	...	...	94, 219
Bhīṣma	...	...	...	ii
Bhoja	60, 230, 231, 232, 248, 249, 254, 257, 262, 264			
Bhoja Prabandha	...	...	...	iii, 60, 231
Bhṛógarājamukha	...	...	...	92, 103
Bhūrjja	...	...	...	39
Bhūtvidyā	...	...	...	2
Bihat	...	...	...	63, 162
Bijnor	...	...	...	162

	PAGE.
Birājacaran Gupta	5
B. L. Sen	5, 27
Brahmā	1, 4, 12, 22, 301
Bramhadēva	17
Brāhmaṇas	9
Bṛsavadhvaja	8
Bucanaka	360
Buddha	ii, XI, 46, 182, 308
Buddhadāsa	49, 50
Buddhaghosha	327

C

Cacyn-nama	355
Cakradatta	29, 30, 31, 62, 66, 67, 124, 126, 128, 141, 143, 161, 162, 164, 173, 175, 176, 183, 185, 189, 190, 200, 201, 218, 222, 227, 228, 229, 245, 248, 253, 255, 258, 323, 327
Cakradhāra	243
Cakrākṛti	96
Cakrapāṇi	41, 125, 164, 204, 259, 265, 271, 282, 292, 350
Cakrapāṇidatta	7, 9, 10, 17, 29, 30, 31, 62, 63, 67, 104, 107, 115, 149, 183
Cakratattwadīpikā	31
Cāla	76
Cālana	75
Chalmugra	360
Cāmara	308
Campaka	310
Candana	354, 355, 359
Candracandana	28
Candra Gupta	35, 40, 344
Candrakumar Das Kavibhusan	31
Candrāte	16
Candravarga	99

	PAGE.
Canouge	350
Caraka, x, 4, 5, 7, 7, 10, 11, 18, 20, 21, 23, 25, 26, 30, 31, 34, 38, 59, 65, 67, 78, 114, 125, 129, 139, 140, 142, 143, 144, 146, 147, 149, 152, 166, 174, 176, 179, 181, 197, 201, 202, 203, 205, 207, 209, 236, 246, 252, 269, 278, 248, 292, 293, 296, 300, 304, 305, 206, 316, 318, 351, 354	
——— Samhitā 2, 4, 7, 8, 9, 31, 34, 40, 41, 59, 65, 67, 78, 86, 115, 126, 130, 133, 136, 139, 140, 141, 142, 143, 146, 147, 149, 151, 152, 174, 176, 179, 201, 203, 205, 207, 209, 217, 237, 247, 269, 292, 293, 300, 301, 304, 305, 306, 307, 308, 316, 318, 320	
——— Tattva-Pradīpikā	10
Carma	94, 183
Cāsamukha	92, 103
Cashmere	5, 356
Caturvarga Cintāmaṇi	56
Cavya	39
Chatra	306
Chedana	77, 79
China	358
Chīna	178
Cikitsā Sāra Saṅgraha	30, 31
Cillimukha	92, 103
Ciravilva	39, 219
Citraka	39, 219
Classification of Instruments	90

D

Dahana	80, 177, 221
Dākodara	97, 122
Dakṣa	4, 12, 341
Dallaṅcāryya 12, 17, 57, 107, 211, 225, 230, 233, 237, 243, 249	
Dāmodara	98, 31

	PAGE.
Danga ...	356
Danta ...	94, 204
Danta-kāṣṭha ...	297
——lekhaṇa ...	98, 267
——śaṅku ...	70, 71, 95, 267
Dānti ...	219
Dāraṇa ...	75
Dārila ...	4
Dāruharidrā ...	359, 360
Darvī ...	214, 328, 360
Daśaratha ...	16
Datta ...	17, 25, 219, 251, 331
Dvārusita ...	355
Devadāru ...	319, 353, 354
Dhāi ...	218, 282
Dhammapada ...	84
Dhanian ...	352
Dhanurveda ...	62
Dhanvantari ...	11, 12, 14, 352
Dhar ...	232
Dhattura ...	359, 361
Dhatushena ...	50
Dirghavaktra ...	233, 240
Divodāsa ...	11
Dravasveda ...	323
Dṛghavala ...	5, 8, 19, 130, 132, 141, 182, 185, 326
Droni ...	323
Dṛti ...	192
Dvīpimukha ...	92, 102
Dvitāla ...	93, 96
Dyatūha ...	99

E

Ekatāla ...	93, 96
Elā ...	39, 359

	PAGE.
Enīpada	269
Enāṇḍa	291, 359
Ervarūka	280
Eṣaṇa	76, 77, 79
Eṣaṇī 77, 78, 79, 80, 95, 98, 99, 173, 174, 269, 273, 279	

F

Faṇībaktra	97
-------------------	----

G

Gaṇḍūpadamukha	93, 97, 98
Ganeśkr̥ṣṇa Garde	27
Ganeś Śāstré Tartevidya	27
Gaṇḡādhar Kaviratna	9, 10, 20
Garbhaśaśūku	97, 165
Gayadāsa	17, 195
Ghatīyantra	97, 151
Gocandana	288
Godhāmukha	95, 99
Goji	282, 291, 292
Golomi	41
Gomedaka	310
Gophaṇā	178
Góphaṇikā	209
Grabhaṇa	80
Gr̥dhramukha	92, 95, 103
Gr̥dhrapada	96
Guḍuci	292, 359
Guggula	41, 354
Gupta	9

H

	PAGE.
Haricandra ...	10
Haridrā ...	291, 292
Harikṛṣṇa Sen Mallik ...	28
Harināth Viśārada ...	10
Harita ...	4, 5, 25, 90, 93, 96, 129, 231, 323
Haritakī ...	130, 354, 361
Haritāla ...	55
Hārta Saṁhitā ...	104, 251, 283, 323
Harṣa ...	94, 212
Haracarita ...	12
Hastipippali ...	39
Hastyāurveda ...	15, 99, 130
Hata ...	328
Hayamāraka... ..	219
Hemādri ...	28, 54
Hiṅgu ...	39
Hirendranāth Mukhopādhyāya ...	XX
Hrasvavaktra ...	233, 240
Hṛdayabodhikā ...	38

I

Indra ...	4, 12
Indravārūṇī ...	359
Indrayava ...	360
Indrāyudha ...	288
Inguda ...	39, 40
Ispaghula ...	360

J

Jalavardhani ...	249
Jambul ...	38

			PAGE.
Jāmvavavadana	...	...	93
Jāmvovonṣṭha	...	97, 99, 159, 217, 234	
Jānumatrāsana	...	...	86
Jaṭila	...	...	41
Jatukarṇa	...	...	4
Javamukhī	...	...	245
———Śalākā	...	...	275
Jayacandra	...	...	269
Jayadatta Sūri	...	114, 158, 235	
Jejjaṭācāryya	...	...	17
Jivaka	...	II, XIII, 231	
Jivānanda Vidyāsāgara	...	9, 17, 21, 27, 33	
Jihvā	...	...	94, 203
——kaṇṭaka	...	...	229
——nirlekhana	...	...	299
Jonivraṇekṣaṇa	...	...	119, 120
Joṣodānandana Sarkār	...	...	9, 28, 31
Jūthikā	...	...	263

K

Kadali	...	...	354
Kadamba	...	...	39, 292
Kākamāci	...	...	292
Kākamukha	...	...	92, 103
Kākolyādi	...	...	220
Kālādānā	...	...	360
Kalasī	...	...	311, 322
Kalodaka	...	...	313
Kāmadeva	...	...	28
Kāmandikya Nītisāra	...	...	35, 45, 198
Kanāda	...	...	333
Kānakya	...	...	352

	PAGE.
Kaniṣka	6, 16
Kanka	353
Kaṇkab	352
Kaṇkamukha	92, 99, 101, 103
Kaṇkapada	96
Kaṇkapatṛa	96
Kaṇkāyaṇa	353
Kaṇṭhaśalyāvalokīṇī	96, 109
Kapāṭa-śayana	87, 342
Kapila	288
Karaṇja	359
Karapatṛa	73, 77, 94, 96, 98, 230, 279, 342
Karapatṛaka	96
Karavīrakapatṛaka	96
Karkataka	99
Karmāra	264
Karṇa-śodhana	163
Karṇa-vedhanī	98, 253
Kārpāsa	350
Kartarī	98, 250
Karvura	288
K-ārapāṇi	4
Kāsi	347
Kaśmaripatṛa	292
Kashmir	313
Kassis	355
Katakaphala	310
Katfala	359
Kaṭhopaniṣada	301
Kapillaka	359
Katuka	361
Katukoshtaki	359
Katurina	359
Kātyāyaṇa	16
Kaumārabhṛtya	2

	PAGE.
Kauśika Sūtra	4
Kāya Cikitsā	2
K. C. Sen	5, 27, 83
Kerala Putra	47
Keśaprasādhani	303
Keśava	4
Khadira	354, 358, 30
Khaja	80, 98, 253
Khal	68, 158, 180, 327
Khallamukha	93
Khar	355
Khāraṇāda	128, 129
Kharjūratrika	99
Khatvā	178
Kikitsa-Vidya	314
Kilima	39
Kirata	359, 360
Kokilākṣa	360
Kolāsthidalumukha	93, 97
Kolinjana	355
Krauñcamukha	102, 103
Kṛṣṇa	8, 287
Kṣāra	94, 213
Kṣura	234, 235
Kubara	355
Kulinjana	353
Kuliśamukha	99
Kullattha	37
Kumuda	292
Kunte	24, 27
Kuraramukha	92, 103
Kuravaka	272
Kuravakaśalā	98
Kūreca	98, 215, 252, 253
Kuśa	177, 195

PAGE.

Kuṣāpatra	...	70, 78, 94, 98, 99, 247, 248, 249	
Kussas	...	...	355
Kuṣṭha	...	...	39, 355
Kuṭhāra	...	...	254, 256
Kuṭharikā	...	70, 77, 95, 96, 98, 254, 256, 279	
Kuṭṭana	...	...	79, 99

L

Laghumañjuṣā	...	...	7
Lakṣmī	...	...	8
Lāngoli	...	...	39
Laṣuna	...	...	39
Latā	...	...	94, 195
Latāka Mīśra	...	...	32
Lekhana	...	...	77, 79
Likhita	...	...	193
Lodhravali	...	...	30
Lohārṇava	...	...	62
Louhamārṇava-Vidhi	...	...	62

M

Mādhava	...	17, 19, 29, 30, 350	
Mādhavācāryya	...	...	29
Madhusūdan Gupta	...	...	17
Mahābhārata,	...	...	i, ii 15, 16
Mahānilatantra	...	...	ix
Mahāvaiṣṇa	...	...	50
Maheśvara	...	...	10
Mahosadha	...	...	338
Maireya	...	...	39
Makaraka	...	...	99

	PAGE.
Makaramukha	102
Makha-deva jataka	105
Mālatipuspavṛṇtāgra	93
Mālavikāgnimitra	iii
Mallaka Saṃpuṭa	143
Mals	277
Mānadaṇḍa	324
Maṇḍala	177
Maṇḍalāgra 70, 77, 79, 94, 98, 99, 165, 225, 226, 227, 228, 230, 239, 260, 279	
Maṇḍukparṇi	39
Mañji tñā	130
Manka	352
Mankba	352
Mānosāra	39
Manasilā	355
Manthana	80
Manusaṃhitā	iii, iv, viii, 65, 191, 192, 193, 353
Mārga Viśodhana	75, 76
Mārjāramukha	92, 102
Māṇa	37, 189
Maṣaka	191
Māsha	219
Masūradalabaktra	97
Masūradalamukha	93
Masurikā	356
Mātuluṅga	354
Mahāvagga, ii, xi, 45, 46, 82, 116, 182, 231, 308, 316, 319, 320, 327	
Mṛganābhi	354
Mucunḍi	106
Mucūṭi	69, 96, 105, 106
Mudga	37
Mudgara	94, 96, 198
Mudrikā	77, 94, 165, 238, 342

			PAGE.
Mukha	...	...	94, 205
Muktābali	...	...	31
Muktabarṣi	...	...	360
Mukulāgra	...	...	93
Mulaka	...	...	219
Muñja	...	...	283
Muñjavalaya	...	...	311
Muṣala	...	...	172, 318
Mūṣika	...	...	288

N

Nāḍi	...	...	91, 93, 98, 108
Nāgadamani	...	...	353
Nāgakeśara	...	...	310
Nagara	...	...	39
Nāgaratiga	...	...	354, 360
Nāgārjūna	...	...	16, 61, 298
Nagorekote	...	...	352
Nāgeśa Bhaṭṭa	...	...	7
Nakha	...	...	94, 204
Nakhaśastra	...	...	70, 77, 79, 94, 98, 237
Nāli	...	...	264
Nāmana	...	...	76
Nandimukhamukha	...	...	92, 99, 103
Nandipurāṇa	...	...	52
Nārāyaṇa	...	...	30
Natthukaraṇi	...	...	84, 116
Nava Vihara	...	...	351
Nayapala	...	...	30
Nibandha Saṅgraha	17, 107, 148, 151, 196, 211, 225, 230, 233, 237, 243, 247, 249, 250, 255, 257, 264, 263, 264, 265, 267		
Nidāna	...	...	29, 30

			PAGE.
Nimba	...	...	354, 360, 292
Nimi	...	...	14
Nirghātana	...	...	74, 76
Nirmālaya	...	...	310
Nītisāra	...	...	35, 45, 198
Nāya	...	...	9
Nāya Candrikā	...	...	17

O

Oṣadhadhāraka	338
---------------	-----	-----	-----

P

Pācana	...	...	221
Padārthacandrikā	...	...	28
Padātala	...	...	94
Paippalada	...	...	3
Paitāmoha Sidhyānta	...	...	348
Pālakāpya	16, 90, 99, 102, 122, 130, 229, 235, 238, 241, 246, 247, 248, 256, 261, 264, 266, 269, 273, 334		
Palasha	...	...	359
Pañcabaktra	...	...	96
Pañcamukha	...	...	110
Pañcaṅgī	...	...	179
Pañcasidhantica	...	...	347
Pāṇīmantha	...	...	205, 262
Paṇīnī	...	...	7, 8
Paṇīpadātala	...	...	199
Paṇītala	...	...	94
Pañjikā	...	...	17
Paramaka	...	...	351
Parāśara	...	...	4

	PAGE.
Parisrāvana	312
Paruṣa	37
Paśa	187
Paṭala	310
Paṭali	292
Pāṭaliputra	345
Pāṭana	78, 79
Pataṅga	360
Patañjali	7, 10, 62
Pāṭhya	28
Paṭṭa	94, 176
Paulisa	348
Pavitra	320
Phalaka	310
Phalavarti	175
Piḍana	75, 76
Pilindavakkha	84
Piṅgala	288
Pipe	85
Pippali	39, 216, 292, 355
Piṣana paṭa	327
Piṣṇana-śilā	327
Piyadasi	47
Palāṇḍu	358
Pongkalāvata*	17
Pradhamana	76
Pradīpa	28
Prakṣālaṇa	76
Pramārjana	76
Pratuda	279
Pravāhaṇa	94, 211
Pracchāna	79
Pramārjana	93
Pratoli	177
Prubhurām Jībanarām	17

			PAGE.
Pundarikamukhi	...	...	288
Pūraṇa	...	...	74, 76
Puṣpanetra	...	...	135, 136
Pyārimohan Sengupta	...	...	31

R

Rājavallabha	...	...	309
Rajju	...	...	94, 175
Rājāsāḍava	...	...	316
Rājatarāṅginī	...	...	16, 24
Rāma	...	...	11, 16
Ramānāth Vaidya	...	...	28
Rampaka	...	...	99, 238
Ram Raz	...	...	39
Rasīarṇava	...	...	28
Rasāyana	...	...	2
Rasik Lāl Gupta	...	...	33
Ray	...	6, 24, 28, 290, 350	
R̥gveda	1, 2, 61, 62, 64, 68, 80, 191, 192, 301, 318, 319, 338		
R̥jugranthi	...	...	209
R̥jukarṇa	...	...	76
R̥kṣamukha	...	...	92, 102
R. L. Mitra	IV ...	62, 192, 193, 196, 304, 305	
Rabi Dutta	...	...	27
Romaka	...	...	348
Romapāda	...	...	16
R. R. S.	...	...	28

S

Saleh	...	...	352
Sāhasāṅka	...	...	10
Sāhasāṅkacarita	...	...	10

	PAGE.
Śaivālamula,	310
Sajika :	355
Śaka :	291
Śakhā	94,282,291
Śākya Muni	8
Śalākā	91,93,96,97,99,155,215,216
Śalākya Tantra	2
Śālotar	352
Śalya	91
Śalyanirghātani	74,96,111,198,199
Śalya Tantra	2,14
Sāḍāsi	106
Śamī	96,113
Sam Mohinī	60
Sāmudrikā	288
Saṁvyuhapa	76
Sana	219
Sanasrad	290
Sanchi	306
Sanchi Topes	327
Sandaśśa	80,91,92,95,96,103,104,105,106,232
Sandaracha	155
Sandhāna	221
Saṅghapāla	358
Saṅjibani *	60
Śaṅkarācāryya	XIII
Śaṅkara Miśra	213
Śaṅkaravijaya	XIII
Saṅketamanjarī	28
Śaṅkha	210
Śaṅku	97,156
Śaṅkumukhī	288
Saptaparṇa	359
Sarad	18
Sarala	219

	PAGE.
Śarapuñkhamukha	98,97
Sarāba Saṁputa	143
Śarari	249.
Śararīmukha	78,95,98,249
Śararīmukha Probe	171
Śārdḍūlamuṣṭhika	99
Sarjarasa	219
Sarkarā	355
Śārūgadhara 31,66,68,115,122,128,140,142,143,144,145,147, 162,175,188,235,286,294,322,323,333.	
Śārūgadharapaddhati	62
Śārūgadhara Saṁgraha 31,66,67,68,115,122,128,138,140,142, 145,147,162,175,188,235,136,286,322,323,333.	
Śārūgadharatikā	32
Sarpavidyā	351
Sarpaphaṇamukha	98,168
Sarpāsya	98,277,278
Sarṣapa	39
Sarvadarśana Saṁgraha	29
Sarvāṅga Sundarī	27,118,225,237
Śaśaghātīmukha	92,103
Śastras	90,94,160,225
Śatapatha Brāhmaṇa	164,301
Śatapuṣpa	359
Śaṭṭaka	316
Satyaputra	47
Saubatsika	96
Saura Siddhānta	348
Savarikā	288
Sāvitṛī	303
Sāyaṇa	29,64
Sāyaṇa's Commentary, I	
S. C. Das	30
Sermicarpus Anacardeum	219

	PAGE.
Śephālikā ...	282, 291, 293
Śibadāsa :	10, 30, 31, 62, 227, 293
Siddhayoga*	29, 30, 184
Śigru ...	219
Śikya ...	311
Śilāditya ...	II, 47, 49
Simhadatmaśtrā ...	99
Simha Gupta ...	25, 21
Simhamuka ...	92, 96, 101
Śirovasti ...	188
Sivana ...	78, 79
Skandana ...	221
Skanda Purāṇa ...	55
Soma ...	220, 303, 318
Sonāmukhī ...	353, 359
Sonnā ...	106
Sphotaka ...	356
Śramaṇa ...	345
Śramaneriś ...	303
Śrgālamukha ...	92, 102
Śribatsa, ...	96
Śrikanṭha ...	124
Śriveṣṭaka ...	219
Śrūga ...	96, 148, 151, 205, 342
Śrūgavera ...	355
Śrutavimśatikoṭī ...	48
Sruva ...	103, 164
Sthagikā ...	178
Sṭhīvana ...	94, 211
Sūci ...	77, 78, 79, 94, 96, 98, 99, 243
Sūcimukha ...	98, 99, 342
Sugandha Marica ...	353
Sukti ...	326
Śūli ...	96
Surat Hospital ...	50

PAGE.

Suśruta IX,X,	2, 5, 6, 11, 12, 13, 74, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 28, 30, 31, 38, 42, 43, 57, 58, 59, 61, 63, 64, 65, 66, 67, 68, 69, 70, 73, 74, 77, 80, 86, 90, 91, 98, 106, 109, 111, 112, 114, 117, 118, 122, 123, 124, 126, 135, 138, 140, 143, 144, 145, 147, 148, 149, 150, 157, 161, 166, 168, 170, 171, 172, 173, 176, 179, 180, 184, 186, 188, 193, 194, 195, 197, 198, 199, 200, 201, 203, 204, 205, 206, 209, 213, 214, 215, 216, 218, 219, 220, 221, 222, 223, 226, 230, 234, 237, 245, 249, 250, 252, 257, 259, 262, 263, 265, 267, 268, 269, 271, 273, 274, 279, 280, 290, 291, 292, 293, 295, 297, 299, 300, 303, 305, 306, 307, 308, 310, 312, 315, 322, 325, 326, 346, 350, 358.	
Suśruta Saṁhitā	1, 2, 11, 12, 13, 14, 16, 17, 19, 31, 38, 42, 44, 57, 58, 59, 61, 63, 64, 65, 66, 67, 68, 69, 70, 73, 74, 77, 80, 86, 87, 91, 92, 100, 101, 103, 106, 107, 108, 109, 114, 117, 118, 121, 122, 123, 224, 133, 134, 135, 139, 141, 143, 145, 146, 147, 148, 149, 150, 151, 155, 161, 165, 168, 170, 172, 173, 175, 176, 178, 179, 180, 182, 185, 186, 187, 188, 190, 193, 194, 195, 196, 197, 198, 200, 201, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 216, 218, 222, 223, 226, 227, 234, 237, 238, 243, 245, 249, 257, 259, 263, 265, 269, 270, 271, 213, 274, 279, 280, 282, 283, 286, 291, 292, 293, 294, 295, 297, 299, 300, 304, 305, 306, 307, 308, 310, 311, 312, 315, 318, 320, 321, 324, 325, 326, 332, 333, 355, 336, 343, 362.	
Suvarṇakha	...	353
Svastika Bandage		
Svastika Yantras	... 91, 92, 96, 100, 101, 177	
Śyenamukha	... 92, 103	
...	...	
T		
Tāgara	...	360
Taittiriya Brahmana	...	195
Tāla	... 91, 93, 96	

	PAGE.
Tāla Yantra	106
Talipot	309
Talponi	309
Tamālpātra	354
Tāmbūl	354, 355, 360
Tanjore Library	5
Tantras	336
Tapasveda	321
Tarakṣumukha	92, 102
Tathāgata	308
Tattva Candrikā	227, 229, 253, 293
Tejapātra	354
Tejpat	346
Thakore Saheb	XV, 29, 331, 358
Tila	361
Tincana	355
Tinduka	39, 40
Tintiḍi	354, 356
Tisaṭa	16
Trapaṣa	280
Tribaktra	95
Trikurecaka	78, 95, 98, 251, 279
Trimukha	110
Tripālā	354
Tripitāka	6
Trivit	354, 360
Tryasṭaka	311
Tūlā	324
Tunna Sevani	209
Tuttha	355
Tvaka-kshira	354

U

Ubhalta	17
Udakamañcikā	311

	PAGE.
Ulākamukha	92
Ulūkamukha Forceps	103
Ulakhala	318
Umeścandra Gupta	24
Undurkarnika	359
Unmathana	75
Unnamana	75, 76
Upānaha	307
Upānahasveda	323
Upaskara	213
Upatisso	49
Upaveda	1
Upayantra	91, 94, 175
Uṣanas	72
Ushira	359
Uṣīra	284
Uṣṇasveda	321
Uṣṇīṣa	305
Utkula	196
Utpala	310, 345
Utpalapatra	77, 94, 98, 99, 240, 241, 242, 258
Utpātana	79, 345
Uttara Tantra	12, 13, 24
Uttara-Vasti	121, 135, 138, 139

V

Vāca	39, 41, 355
Vaḍiṣa	70, 77, 93, 95, 96, 97, 98, 98, 207, 264, 261
Vāgbhaṭa	5, 6, 7

	PAGE.
Vāgbhaṭa I (Elder) ...	18, 19, 20, 21, 22, 23, 24, 25, 31
Vāgbhaṭa II (Younger) ...	18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 31, 67, 69, 73, 76, 79, 86, 88, 90, 96, 98, 104, 109, 113, 114, 117, 127, 136, 141, 143, 144, 148, 151, 156, 159, 160, 166, 186, 187, 189, 190, 195, 197, 198, 199, 200, 201, 203, 204, 206, 211, 212, 214, 220, 222, 225, 230, 232, 237, 238, 239, 243, 247, 250, 252, 253, 255, 256, 257, 258, 259, 262, 267, 271, 272, 276, 277, 280, 289
Vāgbhaṭa, III ...	28
Vāgbhaṭārtha Kaumudī ...	28, 67, 81, 118, 119, 121, 197, 203, 205, 211, 212, 223, 225, 231, 233, 237, 239, 240, 244, 247, 250, 251, 253, 255, 259, 263, 264, 265, 267, 270, 271, 272, 278
Vaidyaka ...	71
Vaidyakaśabdasindhu ...	24
Vairocana ...	356
Vaiśeṣika Darśanam ...	212
Vaiśeṣiki ...	9
Vājasenīya Saṁhitā ...	195
Vājīkaraṇa ...	2
Vajramukha ...	95
Vāla ...	94, 205
Vālaprabodhikā ...	28
Valkala ...	94
Vallāla ...	60, 231
Vallīja ...	39
Vallūki ...	148, 151
Vāṇa ...	12
Vanapālāṇḍu ...	361
Vanaśadhi Darpaṇa ...	5
Vānu ...	30
Varāhamihira ...	347
Vartana ...	74
Vārttikas ...	16
Varaṇa ...	39

	PAGE.
Vaśiṣṭha	348
Vaśiṣṭha Siddhānta	348
Vastī Yantra	97, 99, 125, 137, 342
Vastra	94, 197
Vāsudeva	8
Vata	292
Vatsadanta	99, 256
Vāvvula	360
Vayasthā	41
Vāyu	303
Vedana	77
Vellitaka	209
Veṇikā	94, 176
Vetasa	98
Vetaspatra	77, 80, 95, 98, 264
Vibhītaka	37
Vi aṅga	39, 360
Vijayratna Sen Gupta	26, 27
Vikarṣaṇa	75
Vikramāditya	49
Vikula	196
Vilva	38, 268, 354, 360
Vimbi	268
Vināmana	75
Vinaya Saṅgraha	303
Vracintāmaṇi	62
Vīrasvamī	17
Viṣagranthi	310
Viṣakha	46
Viśamusti	354
Viṣa-pāthara	198
Viṣavaidya	351
Viśrāvaṇa	78
Viśvāmitra	11, 14, 15, 51
Viśvaparakāśa	10

	PAGE.
Vitāna	178
Vivarāṇa	75
Vivartana	75
Vraṇa	356
Vraṇa-vasti	97, 121
Vṛddha Saṁgadhara	70, 71
Vṛddha Suśruta	14
Vṛddhipatra	70, 77, 79, 94, 98, 99, 226, 232, 234, 235, 241, 279
Vṛhadāraṇyaka	81
Vṛhat Saṁhitā	72
Vṛhibaktra	98
Vṛhimukha	77, 95, 96, 99, 123, 256, 257, 258, 259, 279
Vṛkamukha	92, 102
Vṛnda Māṇḍhava	29, 30, 184
Vyādhana	77, 78, 80
Vyāghramukha	92, 102
Vyājani	308
Vyākhyā Kusumāvali	124
Vyāvartana	76
Vyūhana	74

Y

Yājñavalkya	20, 21
Yajurveda	195, 301
Yamaka	178
Yamaka-naṭthu-karaṇi	85, 119
Yantras	90, 100
Yantra-Saṭaka	185, 186, 342
Yaṣṭi	306
Yaṣaṣi-yantra	99
Yava	37, 265

	PAGE.
Yavana	348
Yavāsa	359
Yogarātnākara	66, 124, 148, 151, 162, 168, 174, 185, 189, 194, 208, 248, 259, 271
Yoni-vraṇeṣaṇa	97, 342
Yudhiṣṭhira	21
Yujña-śaṅku	160



CATALOGUED.

Hindu - Medicine

Medicine - Hindu

Set
12/2/76
Surgery - Hindu

Central Archaeological Library,
NEW DELHI.

~~6170 917809545860~~
Call No. ~~617-910954~~/Muk.

Author—Mukhopadhyaya, G.N

Title—*The Surgical Instruments of the Hindus.*
Vol—**I**

"A book that is shut is but a block"

CENTRAL ARCHAEOLOGICAL LIBRARY
GOVT. OF INDIA
Department of Archaeology
NEW DELHI.

Please help us to keep the book
clean and moving.